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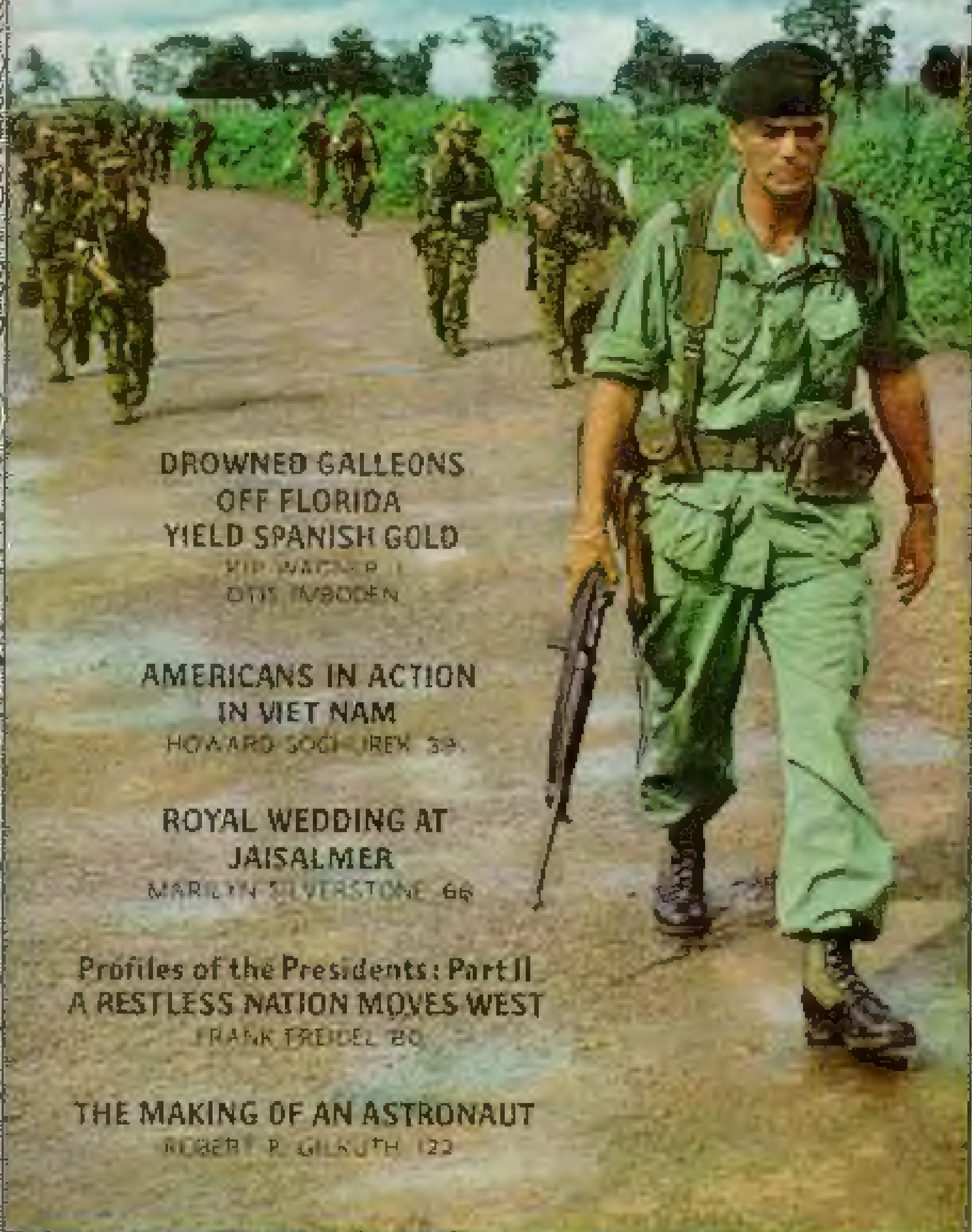
VOL. 127, NO. 1 JANUARY, 1965

NATIONAL GEOGRAPHIC



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THE JOURNAL OF THE NATIONAL GEOGRAPHIC SOCIETY WASHINGTON, D. C.

January
1965

NATIONAL
GEOGRAPHIC

Drowned Galleons Yield Spanish Gold

Adventurous divers in Florida bring up the 20th century's richest find of sunken treasure

By KIP WAGNER

Photographs by OTIS IMBODEN
National Geographic Staff

SUNKEN TREASURE! What magic these words hold! I suppose there is hardly a man—or woman—alive who has not thrilled to stories of silver pieces of eight, of drowned Spanish gold, of pirate treasure. Those of us who grew up on *Treasure Island* still hear, echoing faintly across the years, the screeching cry of Long John Silver's parrot: "Pieces of eight! Pieces of eight!"

Romantics like myself take leave of these childhood dreams reluctantly, telling ourselves that such tales have little basis in fact.

In a recent book on sunken ships I read: "In today's world, 'pieces of eight' and silver bullion aren't likely to be found outside the pages of adventure books. Nevertheless it is still true that the coasts of the United States . . . are dotted with sunken vessels. . . ."

It is indeed still true, and I found that not all the pieces of eight and silver bullion lie in "the pages of adventure books." In Florida waters my associates and I have recovered more than a million dollars in treasure from the rotted remnants of Spanish Plate Fleet ships lost 250 years ago. Our finds have included heavy ingots of silver and gold, magnificent jewelry, gold coins in mint condition, silver dishes, delicate K'ang-hsi Chinese porcelain, thousands of pieces of eight, and several beautiful chains of purest gold.

Hurricane Buries Familiar Beach

One of nature's most powerful forces, a hurricane, sent those richly laden Spanish galleons to the bottom. And, appropriately, my own improbable tale begins with the aftermath of a hurricane 10 years ago.

On a hot still afternoon, after two days of screaming winds, I stood on the low sand bluffs near Sebastian Inlet north of Vero Beach, on Florida's east coast. I was bewildered. The familiar foreshore along which I had beachcombed for so long had been completely altered.

Cloud debris littered the sky to the northeast. The Atlantic heaved lumpily against the

The Author: Housebuilder turned treasure hunter, Kip Wagner directs a team probing sands and shallows of Florida's east coast. From the remains of the Spanish Plate Fleet that sank in a hurricane in 1715, he and his divers have recovered riches worth more than a million dollars. These golden *8-escudo* pieces, also known as doubloons, bear the shield of Spain's Philip V on one side, a cross on the other.

INGOTS OF GOLD, gleaming doubloons, and delicate Chinese porcelain stood beside the sea that hid them for two-and-a-half centuries. Three ships and nearby beaches yielded the treasures; five unexcavated vessels may hold other wonders. These relics lay under 15 to 30 feet of water near Sebastian Inlet, 15 miles north of present-day Vero Beach, where the richly laden fleet came to grief.

horizon, and the dull green surf broke listlessly at my feet. Fifteen feet of the bluff overlooking the beach had washed away, and with it the secret path by which I had come here for the past six months.

As I walked along the water's edge, kicking at bits of purple and green seaweed, something too bright to be a seashell gleamed through a welter of wrack and sand. I picked it up. It was a polygonal piece of silver, stamped with a cross and the arms of Spain. I had found a piece of eight.

The legendary piece of eight of pirate stories is a coin about the size of a silver dollar. It was worth eight *reales*, hence its name. British colonials called it a cob—a word meaning lump—because of its irregular outline.

This storm had a drastic effect on my life. From a rather curious antiquarian, I turned into a highly organized fisher of Spanish treasure. At that time I little dreamed that my new interest would lead to the greatest find of sunken treasure since 1687, when William Phips sailed away to England with a million dollars in silver bars and coin, to be knighted and later made Governor of Massachusetts. Phips reaped his fabulous harvest from a galleon that had gone down in 1643 on the Silver Bank, north of Hispaniola.

Storms Strew Beach With Silver

Severe northeast storms, as well as hurricanes, had occasionally thrown silver coins up on the beach in past years. After a lively northeaster, I had found as many as five. They scarcely made conversation along this coast, where similar finds had long been known.

The harvest was scanty but dependable. I had about forty pieces of silver when the hurricane changed things. Now my money beach lay under a foot of sand and terraced flotsam from the offshore reefs. No smooth

beach, only matted debris. But what of the coin I had just found? Had the storm bared a new trove offshore? I looked at the pounding sea.

One thing I had noticed about the coins I picked up: none was dated later than 1715. A friend told me of a flotilla of Spanish ships carrying $14,000,000 in treasure that had been driven on reef and shore by a hurricane in the vicinity of Cape Canaveral (now Cape Kennedy) in the year 1715. Thus I first heard of one of the greatest disasters to befall the annual Plate, or Silver, Fleet sent out by Spain to bring home the wealth of the Indies.

John Taylor, a captain's clerk in one of the guard ships assigned to protect William Phips during his epic salvage, described the Plate Fleet system in flowing language:

"The King of Spain, whose dominions are now extended from the east to the west, whose kingdoms are full one third part of the known world, whose treasures in his western dominions are rich and durable mines of gold and silver . . . without bottom or a seeming end, from whence flows the wealth of Spain, by which the pomp, state, frontiers of that kingdom are maintained and defended, yearly sends his . . . mighty ships of Spain into America, which moving road bring him home his annual treasure of gold and silver. . . ."

Spain sent two fleets annually to the New World. One, the Galeones de Tierra Firme, or mainland fleet, sailed to New Granada—present-day Colombia—where it picked up gold, emeralds, and pearls at Cartagena, and later silver from Peru's fabled mines at Portobelo on the Panamanian Isthmus. The other, the Flota, or fleet, of New Spain, sailed to Veracruz, on the Gulf Coast of Mexico. There it took aboard silver, cochineal and indigo dyes, as well as goods of the Orient—porcelains and silk—which came to Acapulco, on Mexico's Pacific Coast, in the annual galleon

Beside the heaving Atlantic, a treasure seeker searches the beach with a mine detector. The apparatus emits a high-pitched whine over metal objects as small as fishhooks; it has pinpointed ships' spikes, cannon balls, cutlasses, and coins by the hundreds.

"My first investment in salvage equipment was a $15 surplus military mine detector," says author Wagner, "and I still use it, especially after storms have reshaped the sands. Usually my only companions are formations of pelicans that fly over, wheel, and look down at me with seeming perplexity."

Silver pieces of eight, called reales, look like bits of green stone following a 250-year bath in brine. Coin at left shines again after hydrochloric acid dissolved the thin coating formed by the action of salt water on copper, a hardening agent in most silver coins.

Shrieking like a thousand banshees, hurricane winds shred the waves and shatter the Spanish treasure fleet. In this artist's recreation, the tropic-spawned tempest dashes the ungainly galleons on to saw-toothed reefs. Desperate crewmen climb high in the rigging while others battle giant combers in an effort to gain the safety of the shore. Ships fall apart, their backs broken, and precious cargo spills and sinks. More than a thousand souls perished, and $14,000,000 in gold and silver vanished into the depths.

from Manila and then were shipped overland by mule train to Veracruz. The two fleets joined in Havana, Cuba, for the homeward voyage across the Atlantic.

A West Indies jingle warns of hurricane time: "June, too soon; July, stand by; August, come they must; September, remember; October, all over." Originally, the fleets had wintered in the Caribbean and sailed for Spain in June, so that they would be well clear of the treacherous Straits of Florida before the dreaded season. But little by little, through bureaucratic delay and difficulty in manning

the vessels, sailings came later in the year, until it was routine for the fleets to return at the height of the dangerous season of high winds.

The War of the Spanish Succession, which embroiled half of Europe before peace came in 1713, delayed the sailing of the Silver Fleets for two years. The two fleets, greatly diminished in number, had met at Havana as the "Combined Armada of 1715." In July of that year they sailed from Havana, up the Straits of Florida, riding the Gulf Stream to Cape Canaveral, whence they would strike out across the Atlantic (map, page 10).

In Seville, center of Spain's colonial trade, there stands an imposing building, the Archivo General de Indias, the richest repository of historical Spanish-American documents on earth. From these archives I obtained copies of hundreds of folios dealing with the great catastrophe of 1715.

The pilot of one of the ships, with a handful of survivors, struggled north to report to the Governor of the Spanish settlement at St. Augustine. Across the void of two-and-a-half centuries this eyewitness speaks to us: "Captain Sebastián Méndez, pilot of the

ship called *Nuestra Señora del Carmen*, alias *La Holandesa*, under command of Don Antonio de Echeverz, commander of the Galleons, who before me, the notary, took the oath by God Our Lord and the sign of the cross as is customary, undertook to tell the truth, and being questioned . . . the declarant stated that he departed from Havana on the 14th day of July in company of the Galleons and the Flota, and he was lost on Wednesday the 31st, at two o'clock in the morning, because of a hurricane which came on from the east-northeast so strongly that although he has sailed the seas for many years and suffered through many tempests he has never seen another like it for violence, and his ship and all the rest were lost, some before and some after Palmar de Ays, at 28° 10′ [North Latitude] . . . in an area nine leagues [27 miles] from north to south."

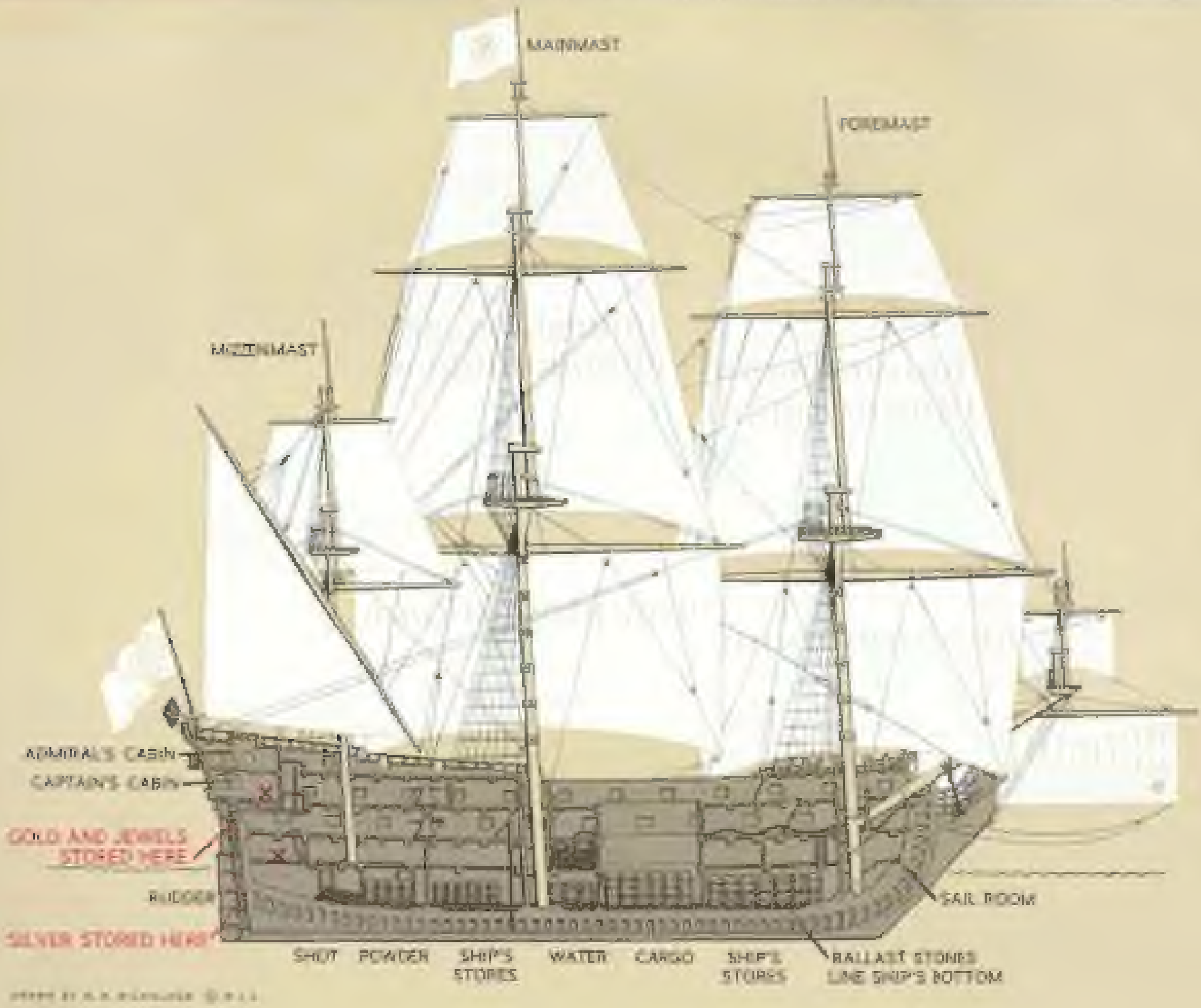
As I fingered transcripts of old documents, I seemed to feel Havana's hot sun on my back.

Wednesday, July 24, 1715. A signal gun booms from the flagship. Answering guns thunder from the arm walls of the Morro, and the fleet suddenly comes to life. Seamen jump to the capstan bars; the pawls clank as the great iron anchors come slowly aboard. Halyards are swayed tight and the yards braced round. The combined fleet of Gen. Don Juan Esteban de Ubilla and Gen. Don Antonio de Echeverz is under way.

A handsome sight, these 11 vessels, as they heel to the wind in the pull of the deep blue Gulf Stream. The high-prowed vessels roll up past the Keys under a cloudless sky.

Monday, July 29. Seamen look distrustfully at the sky. The sun still shines, but there is a slight haze. The heavy galleons roll in the long swell of a glassy sea. Under their lee are the sharp-toothed reefs and treacherous shoals of the low Florida coast.

Tuesday, July 30. By noon the wind dies.



"Treasure fever had me in its grip," says the author, "when I first saw this 1774 chart of east Florida by English cartographer Bernard Romans." On his chart, Romans noted: "Opposite this River, perished, the Admiral, commanding the Plate Fleet 1715. . . ." The river was Sebastian Creek, and in a cove near its confluence with the Indian River, Mr. Wagner found so many old coins washed ashore that he called it "my money beach." "Wreck" notation north of Cape Canaveral refers to a 1768 sinking. Eighteenth-century dividers, still in working condition, came from a wreck site explored by Mr. Wagner's diving team.

Old Spanish script on a microfilmed document recounts the storied survivors. Dazed and hungry, the castaways staggered into St. Augustine and gave depositions about the night of terror. Here the author (left) confers with National Park Service historian Luis R. Arana, an authority on old Spanish. The Archive of the Indies in Seville, Spain, preserves the original records.

Closeup of canvas overspread an *Almiranta*, an admiral's flagship. The 155-foot vessel had a mainmast 150 feet tall; its poop stood 27 feet above the waves. Mounting 50 to 60 guns, such ships served for fighting and convoy duty, but carried little cargo except treasure. Galleons had disappeared as a type by 1715, but the romantic term survived long after as a name for treasure vessels.

New World parts northwest [illegible]

[illegible] America. A French port [illegible] from the [illegible] the rigging with [illegible] Stinging spray where [illegible] breaking waves. Although it is [illegible] the good storm [illegible] are [illegible] The [illegible] against the [illegible] rock over the bow of [illegible]

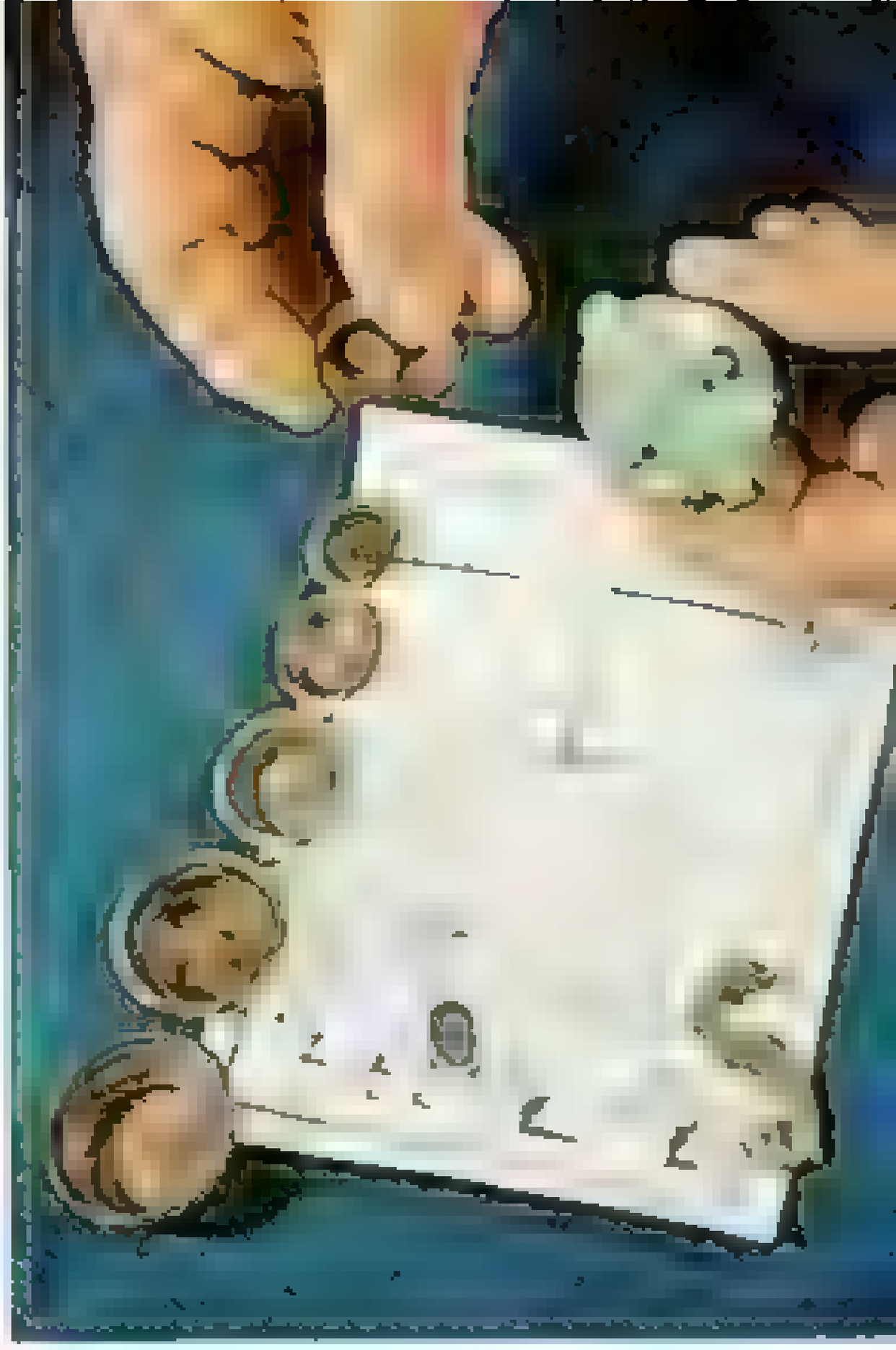
[illegible] the hurricane strikes [illegible] The galleons stagger and heel. Officers shout [illegible] that no one hears. New each ship [illegible] its own. Some claw for sea room, but [illegible] between [illegible] and the [illegible] must [illegible] and are [illegible] shrewd. Some try to anchor. But the anchors fail to hold. Up [illegible] the mast can break [illegible] the suffocating mixture of wind and [illegible] [illegible] masts and [illegible] hose washed overboard and there [illegible] After [illegible] with rending crashes they [illegible] the heavy hours and [illegible] the [illegible]

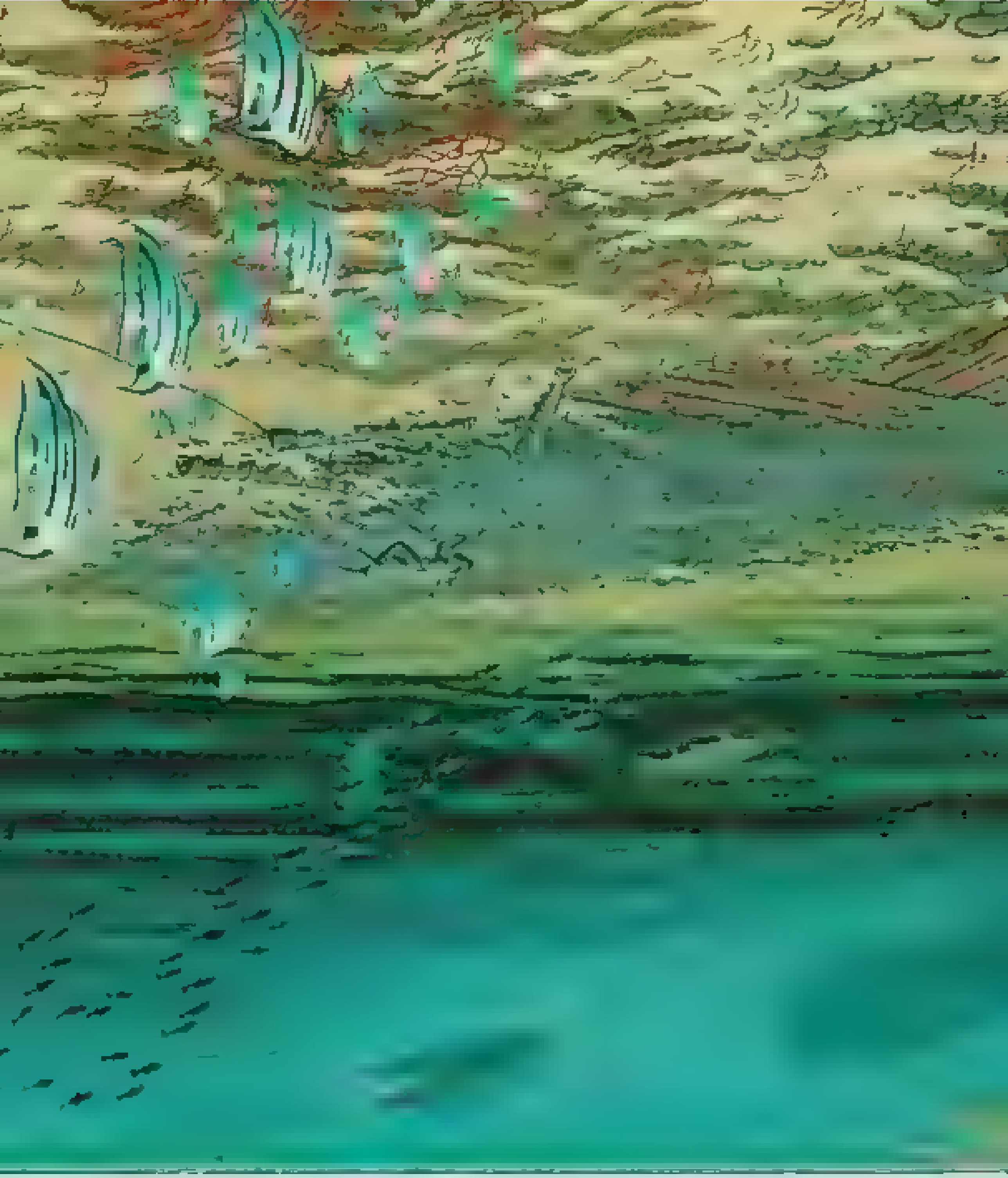
[illegible] over ships and men [illegible] ship, only one escaped. The French [illegible] Gordon which [illegible] forced [illegible] with the fleet to keep their ship [illegible] [illegible] the treasure [illegible] The Spanish historian [illegible]

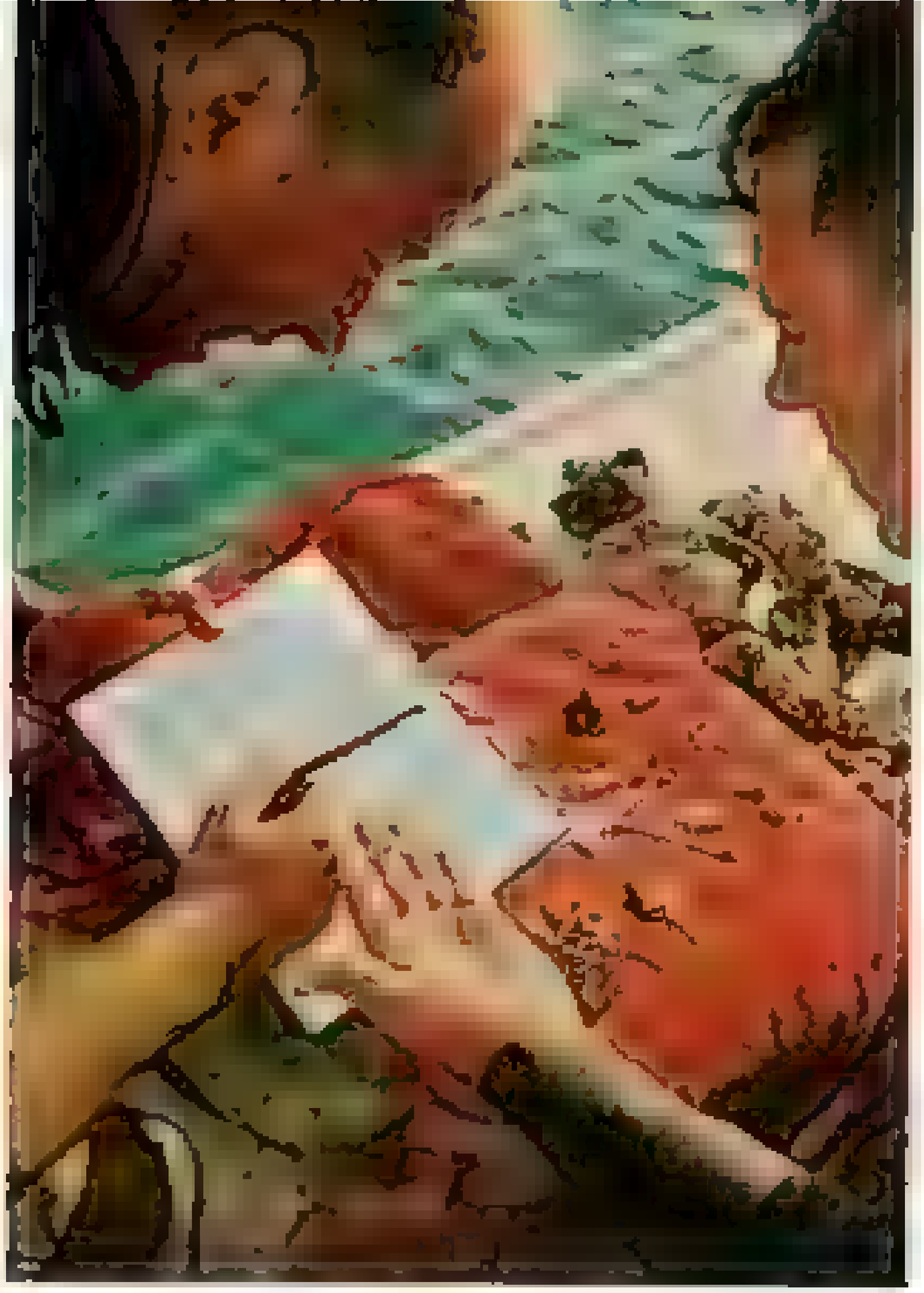
90
85
80
75
70
Deg. w. from London
MARYLAND
VIRGINIA
Jamestown
C. Charles
Bay of Chesapeak
Albemarle Sound
C. Hateras
Look out
C. Fear
C. Cartaret
Charles Town
Port Royal
Savana R.
Alatamatha R.
Fort St. Augustin a Spanish F.
Ouabach R.
Ouabache R.
Charakees
Apalache
FLORIDA
C. Florida
Tortugas
Mississipi R.
ATLANTICK
OCEAN
Note 10 of 11 Plate Fleet Ships were Lost off the Coast of Florida in the Terrible Hurricane of 1715
Barmudas Isl. English
The Galleons and Flota usually rendezvous at the Havana & whole Armada Sail for Spain thro this Gulf
Variable Winds
ANTILLES
BAHAMA ISLANDS
Lucayos I.
Eleuthera
Salvador
Rum I.
Gulf of Florida
Tropick of Cancer
MEXICO
Havana
CUBA I.
St. Iago
Hispaniola
St. Domingo
French
Span.
Jamaica
Port Royal
Greater Antilles Isles
NORTH SEA
Honduras
Nicaragua
Costarica
Veragua
Bay of Panama
New Granada
Carthagena
St. Martha
Rio de la Hacha
Curassow
Bonaire
Lee Antilles
Caracos
TERRA FIRMA
SOUTH SEA
Cozumel
Campechy
Merida
Jucatan
Grand Cayman
Porto Bello
Darien
Maracaybo
Trucillo
Orinoco
90
85
80
75
70
65

Prizes from the sea

T







[illegible]

Beurded and hooped sand [illegible]

[illegible]

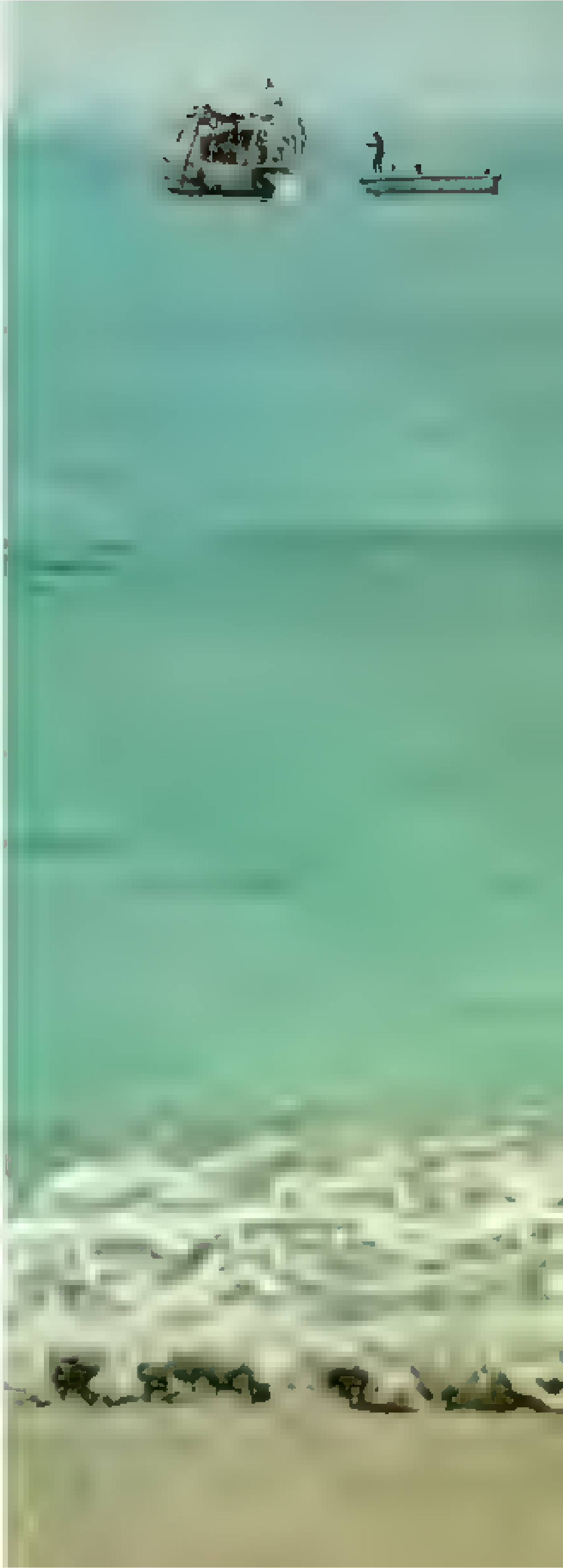
So close and yet so tragically far. [illegible]

[illegible]

[illegible]

Now I was really hooked. I [illegible] the compass, carefully [illegible] the [illegible] of each bird and [illegible] at every bend of a [illegible] sound. Most [illegible] were formations of [illegible]. They seemed to [illegible] [illegible] about my [illegible] [illegible] [illegible] evening toward sun[illegible] [illegible] some of them evidently [illegible] out of [illegible] way to pass over [illegible] wheeling and [illegible] [illegible], as if searching for a [illegible] among the multiplying sand [illegible] and [illegible].

I wished I [illegible] pelicans [illegible] [illegible] I knew [illegible] from the free [illegible] among this [illegible], and perhaps from the car I might see some [illegible] [illegible] [illegible] found. I [illegible] I was [illegible] the beach southward with no great regret [illegible] were



Scanning the ocean from the air, spotters seek signs of a sunken wreck. When they [illegible] they radio word to the [illegible] Sea Dragon, which turns toward the exact [illegible] where [illegible] drops a marker. [illegible] of reconnaissance. Submerged ballast stones and decayed timbers usually produce a darker pattern in marked contrast to the [illegible] around the vessel.

Gold plucked from the ocean: every man's dream of discovery. But [illegible] put a foundation under his dream. "I spent 15 years in research," says Mr. Wagner. "I [illegible] a crew of [illegible] working divers and [illegible] boats [illegible] with gear. And above [illegible]"

Vacuum-scouring the sea floor, a diver with suction pipe [illegible] debris. Another [illegible] examines the material [illegible] the pipe. Later they [illegible] the heaps of [illegible] to be sure no [illegible] has been overlooked. The [illegible] water hunters [illegible] each ship [illegible] any part of the wreck. Rare clear water [illegible] blue [illegible] green.

[illegible] sand has flown [illegible] from the cast of seaweed [illegible] gave us the last ones and some of the guns. The bones of [illegible] had been [illegible] years would be needed. I thought to make enough salvage to meet [illegible] permit even a cursory search of the wreck.

And [illegible] I launched myself with a modest splash into the vast ocean of underwater ar[illegible] equipment outlet I bought a 42-foot Navy shore leave launch [illegible] enough. [illegible] would be a kind word for her appearance. I christened my vessel *Sampan* and set about [illegible]

Florida Issues "Gold Fishing License"

In a few weekends I had a team of eight [illegible] Dr. [illegible] Kelso, a [illegible] physician, [illegible] and Airman Donald Dan F. Thompson and Jerry E. Cannon from Patrick Air Force Base, headquarters of the Atlantic Missile Range, signed on as diving specialists and navigators. [illegible] ex-Navy demolition diver Lucas [illegible] was a valuable man under water and [illegible] served as chief technician for salvage equipment.

[illegible] always expert, skippered the *Sampan*. Our [illegible] working mates were [illegible] and Ervin W. [illegible] with a knowledge of the shores [illegible]

[illegible]

Later we added Capt. Jon [illegible] and Warrant Officer Robert [illegible]

Our swashbuckling predecessor, Henry Jennings, while not authorized by the English authorities, [illegible] the other way. [illegible] of [illegible] we [illegible] of the Trustees of the Florida Internal Improvement Board, [illegible] among other things, the recovery of sunken treasure. The State of Florida permits the [illegible] percent of all valuables recovered.

[illegible] the Keys [illegible] by paying fees and submitting regular reports, we could [illegible] evidence [illegible] historical times, the authorities would protect our rights against any [illegible] interlopers.

Experts from Florida [illegible] University [illegible] Improvement Fund [illegible] of historical [illegible] such men as Dr. J. C. Dickinson, Jr., Director of the Florida State Museum at Gainesville, and Dr. William H. Sears, Chairman of Anthropology, Florida Atlantic University at Boca Raton.

Putting out to sea in the *Sampan* on one of our first diving excursions always reminded me of "The Owl and the Pussy-Cat." We had

[illegible]

[illegible] so we made a [illegible] another of [illegible] [illegible] anchored, *Sampan* settled herself over the wreck [illegible] [illegible] a restless [illegible] under her, [illegible] over her [illegible]

At the side [illegible] began passing [illegible] and [illegible] for the shallow-water dives [illegible] boarding ladder, [illegible] extra marker buoys, [illegible] baskets and [illegible] lines. In a few minutes larger [illegible]

[illegible] below water the swirling surge gives way [illegible] dark [illegible] on a ceiling of [illegible] light bubbles shimmer upward [illegible] [illegible] you [illegible] feet on [illegible] ridges of [illegible] Now [illegible] as you reach bottom the surge [illegible] lifts you and sweeps you [illegible] over [illegible] rocks and wavering sea grass. You grasp [illegible]

diver emerges with gold in his grasp.

[illegible] feet swing [illegible] with the surge [illegible] you feel [illegible] [illegible] easier. This can be [illegible] lips tasting to least [illegible] Your mouth is [illegible]

We carefully examine our [illegible] ballast stones, and sand overburden. They [illegible]

[illegible] most [illegible] ceeded [illegible] headed [illegible] bringing them up and the [illegible] old a [illegible] Michael [illegible] the [illegible]

Finally even Mike grew weary. We [illegible] if they had enough [illegible]

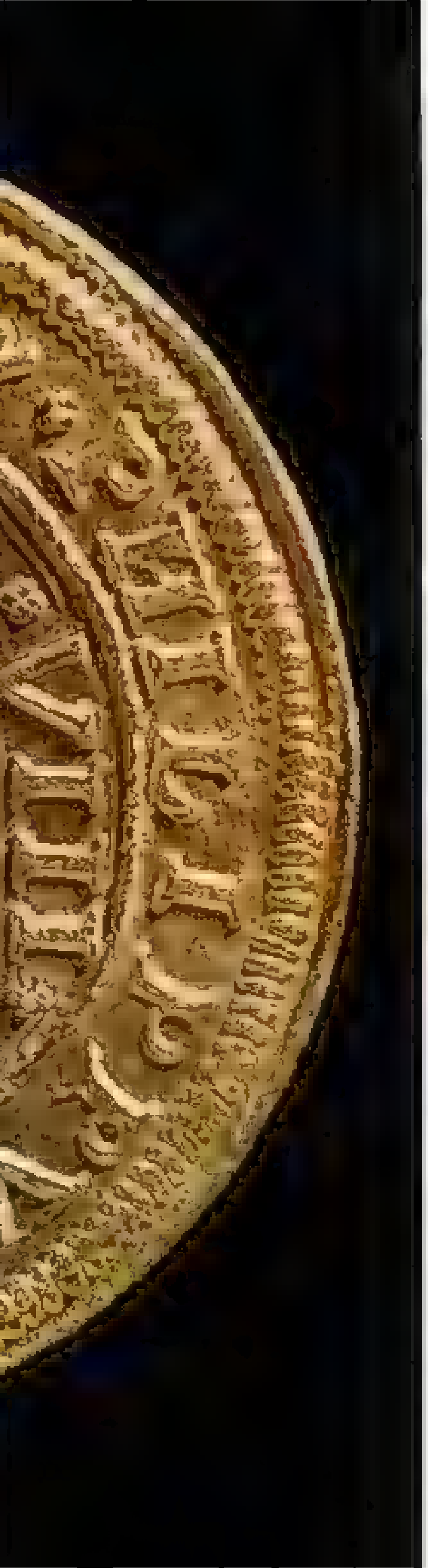
[illegible]

"We've got to move sand." This was the [illegible] of our salvage problem. To solve it [illegible] pumps and hose from *Sampan* to create [illegible] tion through [illegible] [illegible] [illegible]

Now, instead of passively seeking the [illegible]

Golden doubloons and silver pieces of eight

COINS RECOVERED FROM THE 1715 TREASURE *fleet bear crown on one side, coat of arms on the other. The gold, a noble metal, resisted corrosion during its centuries of submersion, but some of the silver shows the effect of sea water. Symmetrical doubloons were struck more precisely than the angular, oddly shaped silver pieces, which probably were destined to be retrack in Spain. In terms of today's monetary value, each doubloon had a purchasing power of several hundred dollars in the early 18th century; each silver coin $10 to $15. On the modern coin-collector's market, doubloons fetch $400 to $1,000 apiece; the silver coins as much as $100 each.*



"Pve found the captain's cabin," shouted Dan. "Long as he handed up a frozen carpet. Here's some of the stuffing!"

The "stuffing" we later identified through the good offices of the Smithsonian Institution's Chairman of Applied Forces History, Mendel Peterson, as a mixture of cow hair and patch with which the Spaniards sometimes coated their wooden hulls against the ever-present teredos.

In a basketful of litter sent up from the water one day we found a Lowe-type musket-size gun, which had been exposed to a metallic color spoke strangely. The next basket brought up five wedges of blackened silver, last in a circle eight inches in diameter, the wedges made a silver "pie" with a gap for the encrusted piece. Three layers of these "pies" would fill a small keg, a kit pounds for an Indian bearer. Two barrels would be a full load for a donkey.

Pitching under the ballast we found three more of the silver wedges, but we were searching for the rest of our barrel of silver in the process. However, we convinced ourselves that we were over the keel of the ship. Our hard-won experience was beginning to teach us something of the process by which a ship decays. Lighter materials had all disappeared years ago. The silvers, heavier, may have survived for no more than a few hundred years. Indians, the Spanish, and later freebooters would have made off with everything worth carrying away.

So we surmised that the cargo would be inaccessible to divers who had to rely on breath. Heavier objects—like the guns—would settle to the bottom practically on the spot. And, since the precious metals are extremely heavy, we centered our search along the lower area of the bank, where the ships ribs join the keel.

New Secrets to Divers on Schooner

New finds followed up with a regularity that soon became tedious. Once it was a silver cup and one weighed the unknown quantity of silver disks, a shield inkwell, up to a sixty-foot depth, we found.

On another trip we found a set of bronze weights, all nested together like gradated cups (page 15). In the meantime we continued to find occasional coins—sometimes the silver pieces of four or two reales.

Time, some of the most fascinating pieces have been pieces of seaweed encrusted of that forced gas. We turned up three pairs of glass navigation dividers, one still in working condition, and a 2-pound of saltcellar, but 1712 that's a most an exact counterpart of the weights still in use today—a striking example of the functional size of a sailor's tools as well as the conservatism in the ways of the sea (page 16).

Mass of "Rock" Holds a Surprise

"I need a rope!" Dan Thompson seemed strangely excited. He took a turn on one and went over the side.

"Help me pull!" He handed up one end of the line and dived as we thought we were hearing him move some larger but last piece of debris. We heaved on the line. We could see he was treading water as hard as he could.

"Pass it carefully!" he called, but the weight of it [illegible] was too big to be up at least.

We fastened the line until he was alongside the boat, then released it as we all rushed to the rail. Dan went under again with his arms wrapped around something dark. Many hands seized the line, we heaved together and fast, as we passed a greenish black mass over the rail (page 15).

When it tagged at one edge it came away and several emerged from the heart of the dark mass. Here in one chunk were more than 50 coins of silver coins.

We expected a few coins, perhaps even a nugget or a bar, but this was something out of all proportion. In one brief dive we had more than doubled the value of our previous finds.

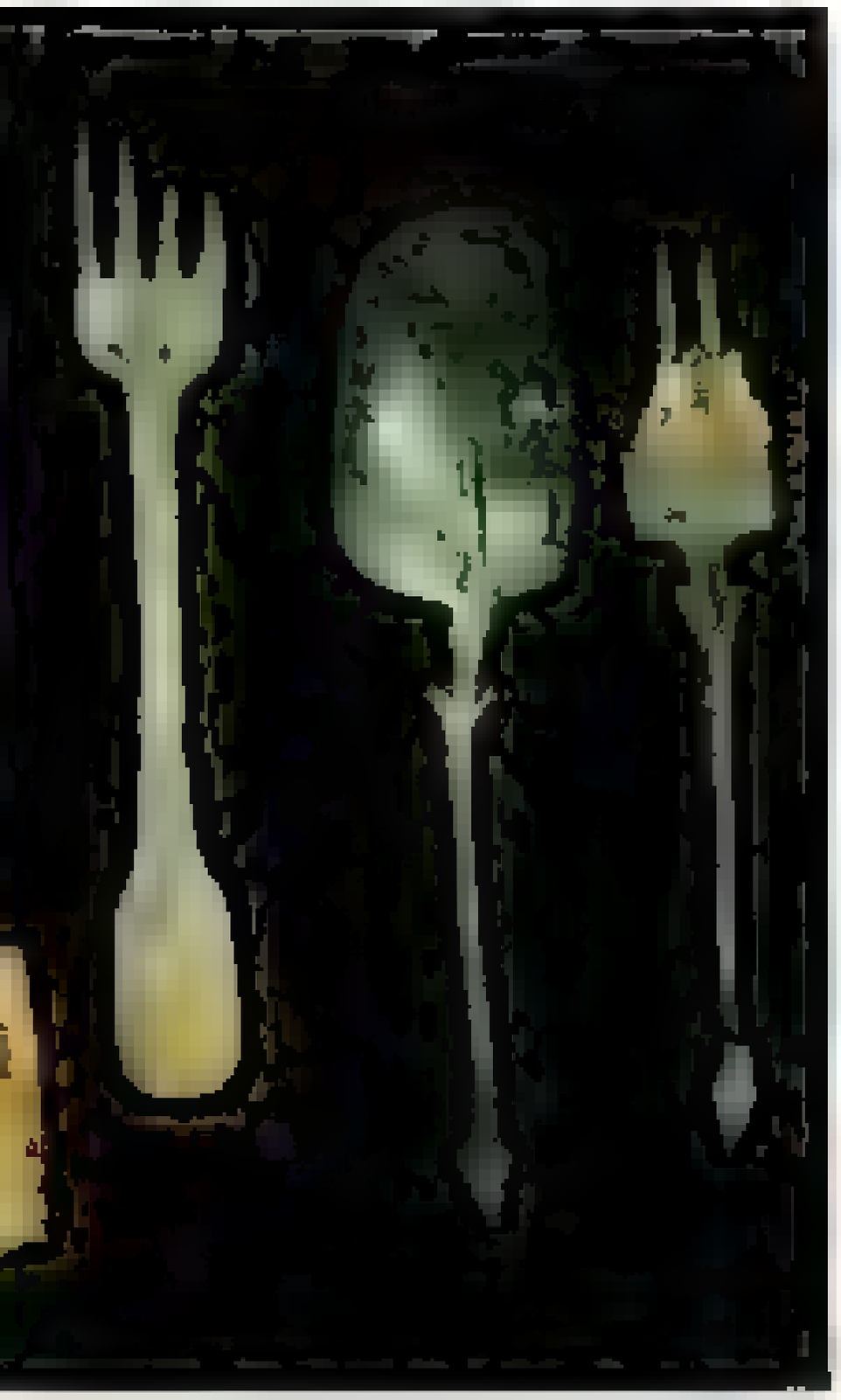
Before our astonishment could wear off Dan went down again, this time Harry Cannon [illegible] and the two brought up another [illegible] as big as the first.

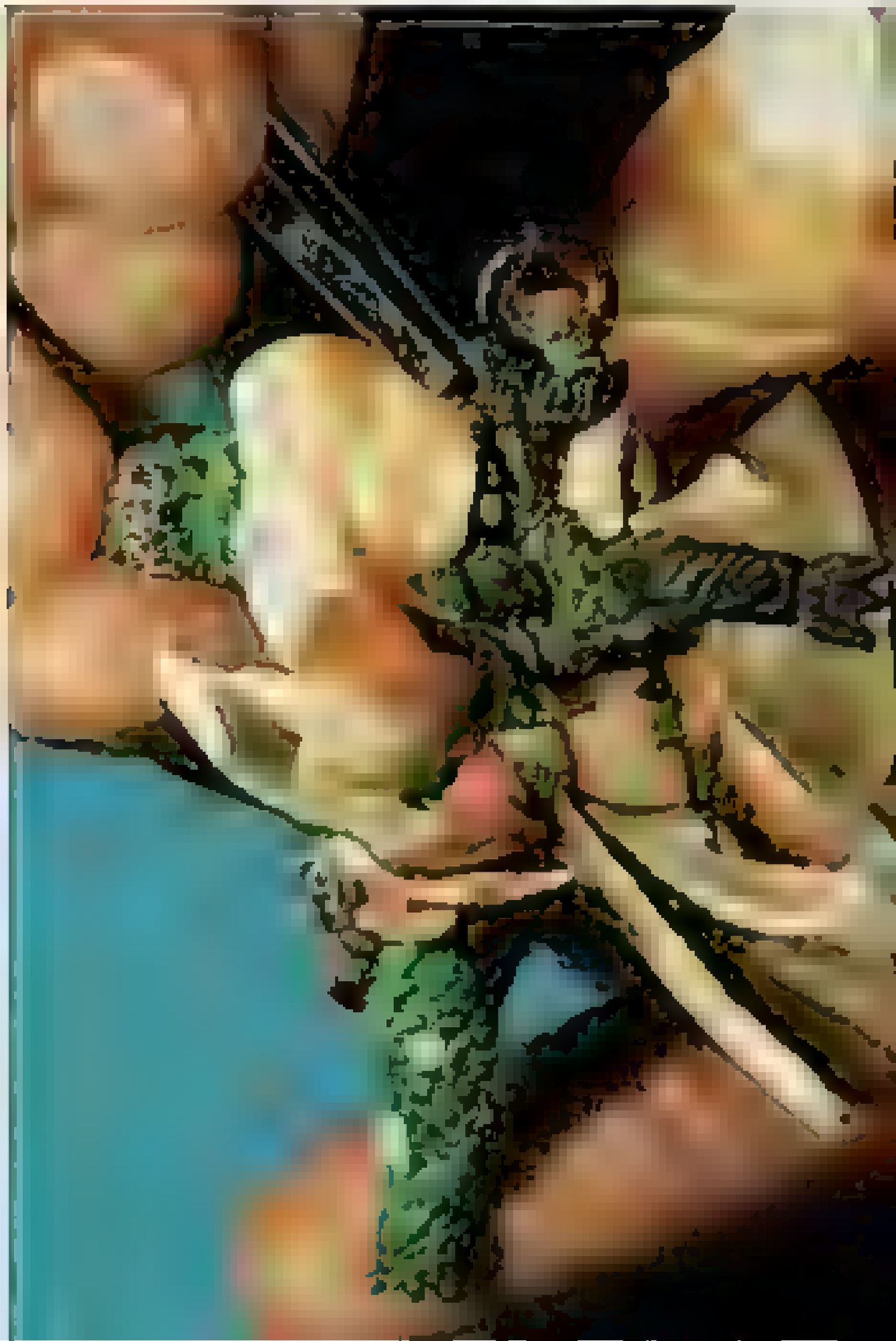
The outermost layer of these coins is too hard to be scraped, but by a treatment called electrolytic reduction, a solution of zinc and caustic soda recovers the corrosion to metallic silver.

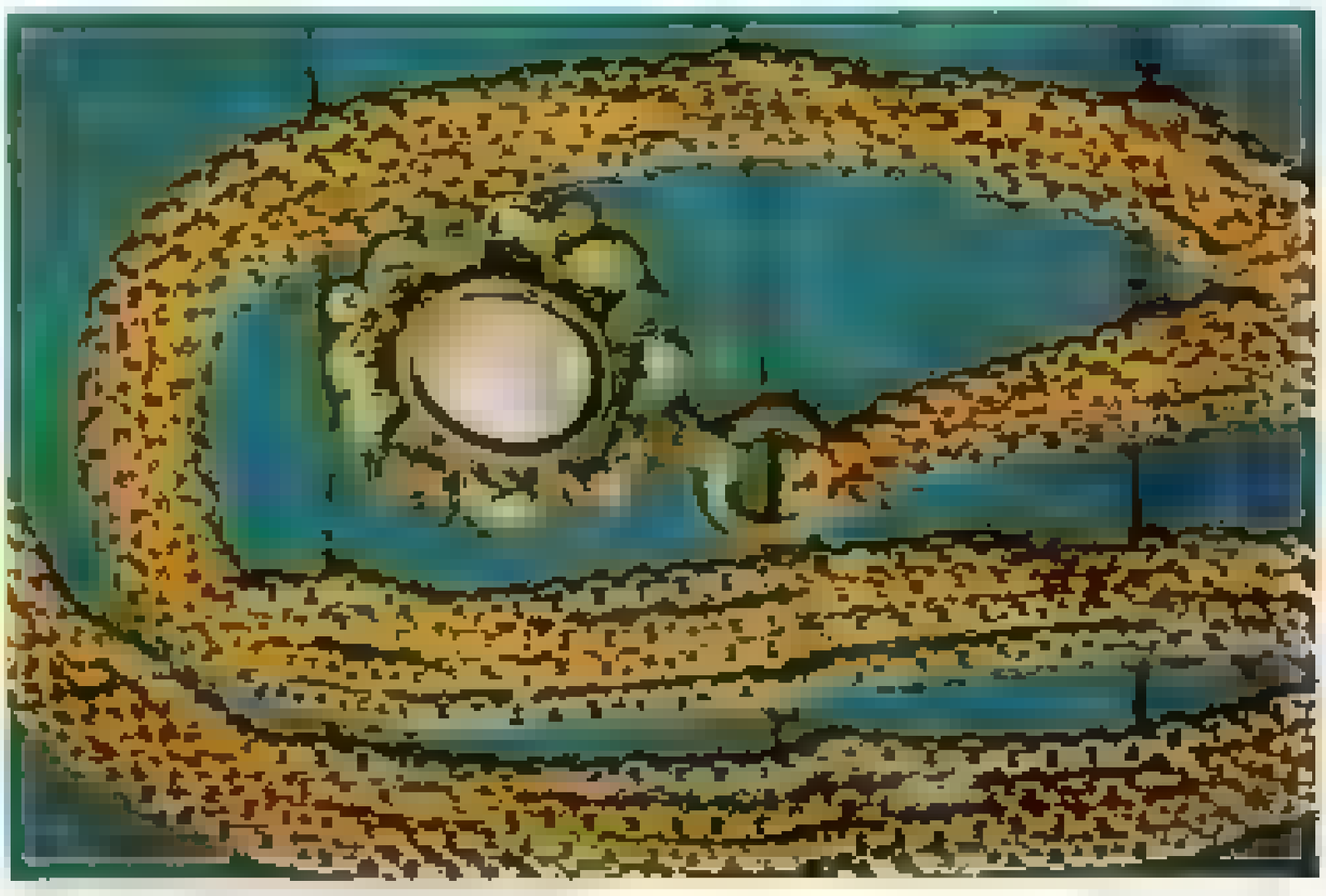
Coins in the center of the clumps remain a great deal encrusted. Some are as bright and medium red as the day they were minted.

These ancient coins look crude compared to the well-trimmed coins of other eras. Part of their fascination, however, lies in their irregularity. No two coins are alike (pages 26-7). Each piece was chiseled from a flat bar of silver and then stamped with the royal coat of arms on one side and a cross on the other.

X-ray picture of [illegible]







As our diving tra[illegible] a [illegible] er, we [illegible] ted [illegible] s by [illegible] a beach [illegible] place near the diving site. Now diver[illegible] [illegible] gear at the [illegible] and swim out to the boat. Two-way radios provide a ship-shore link. Light beams [illegible] at [illegible] boat [illegible] the sea bottom. Our dred[illegible] [illegible] tons of sand [illegible] of the time it used to take.

About [illegible] perhaps [illegible] and adventure can be the treasure diver's friend or enemy. Usually we welcome a heavy blow. It [illegible] because [illegible] of the sea may uncover new areas of search, or uncover the beaches for our metal detectors. But the hurricanes [illegible] 1964 nearly undid our whole season's work. None of them, from Abby to Isbel, deposited a total of two to three feet of sand on our site. Next season we shall need [illegible] of dredging to reach the level we worked at the beginning of 1964.

Clouds Open Over a Carpet of Gold

We have expanded our team by joining forces with a highly competent professional [illegible] the leadership of Mel Fisher. [illegible] with them a [illegible] sunken ferrous metal and other detectors [illegible] of gold, silver, and other [illegible]

It was Fisher's group that made one of our [illegible] [illegible] Along [illegible] found four gold [illegible] [illegible] that [illegible] a [illegible]

re[illegible] while doing research on the 1715 disaster. He [illegible] us to five [illegible]. Divers of both groups were working there one day scouring the bottom with a water jet. Suddenly the clouds of sand [illegible] parted. There before our [illegible] eyes lay a carpet [illegible] golden doubloons. We have since found more than twice that number [illegible] silver coins by the thousands.

As I write this, I have spread before me on [illegible] a few samples of the finds from only the past few months. Here are two [illegible] ingots, one weighing three pounds and the other eight pounds of solid gold. Here is a 26-pound ingot of silver and a two-foot-long [illegible] bar dated 1650. There are gold rings [illegible] medallions and a collection of gold coins. But this [illegible] sampling.

As I said, we now estimate our take [illegible] more than a million [illegible]. But when I look back on our [illegible] over the years, [illegible] almost meaningless. The real treasure lies [illegible] the [illegible] with [illegible]

[illegible]

[illegible] the Plate Fleets. And we [illegible] We have definitely located several more wrecks, and in coming years we hope to [illegible] together more [illegible] of the [illegible]

[illegible]

The excitement of the search, even the [illegible] of waiting [illegible] have provided moments that can[illegible] be bought. Every find comes as a gift from the sea, and our [illegible] will always be the unforgettable [illegible] of discovery.

King's ransom covers [illegible] the [illegible] of the treasure [illegible] [illegible] beyond the sands [illegible]

[illegible]

Chest of gold [illegible]

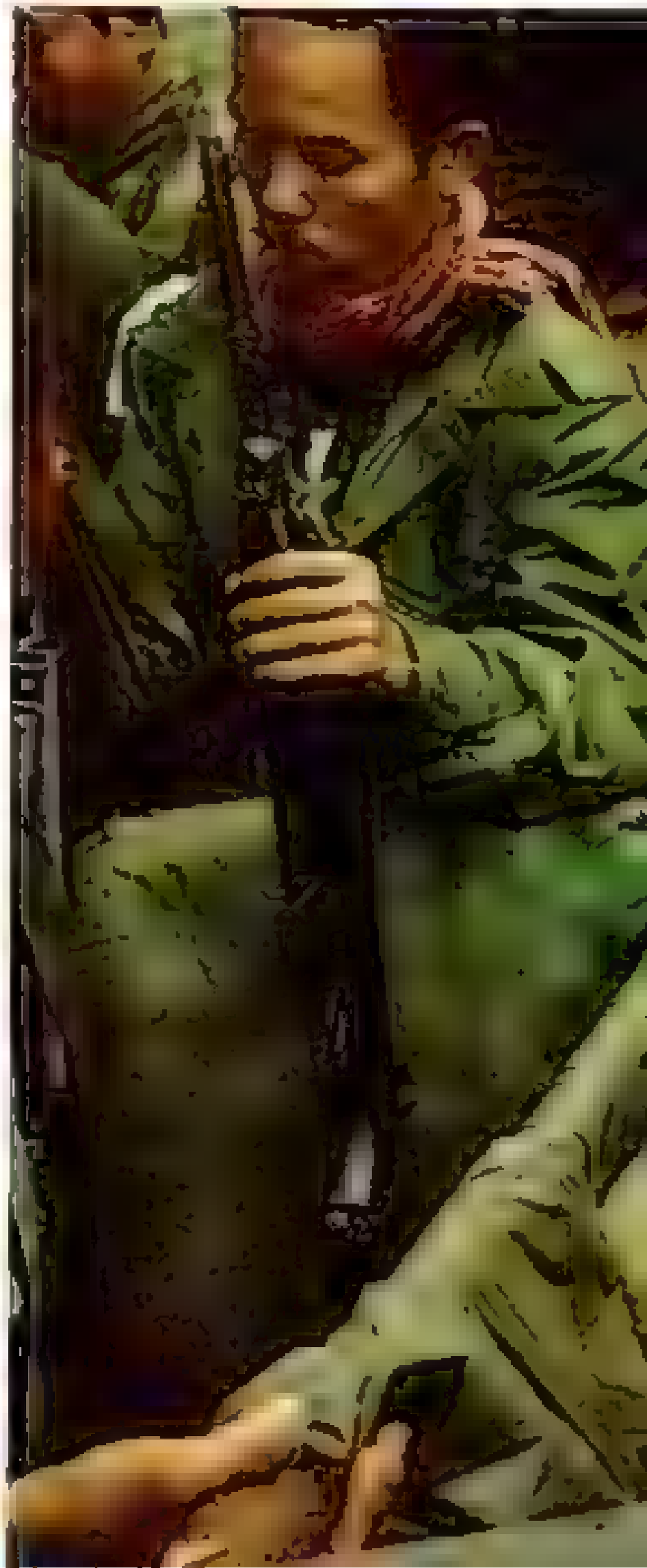
[illegible]

[illegible] from the frothing surf. A [illegible] [illegible] his [illegible] says the author. I know, because it happened to me.

American Special Forces

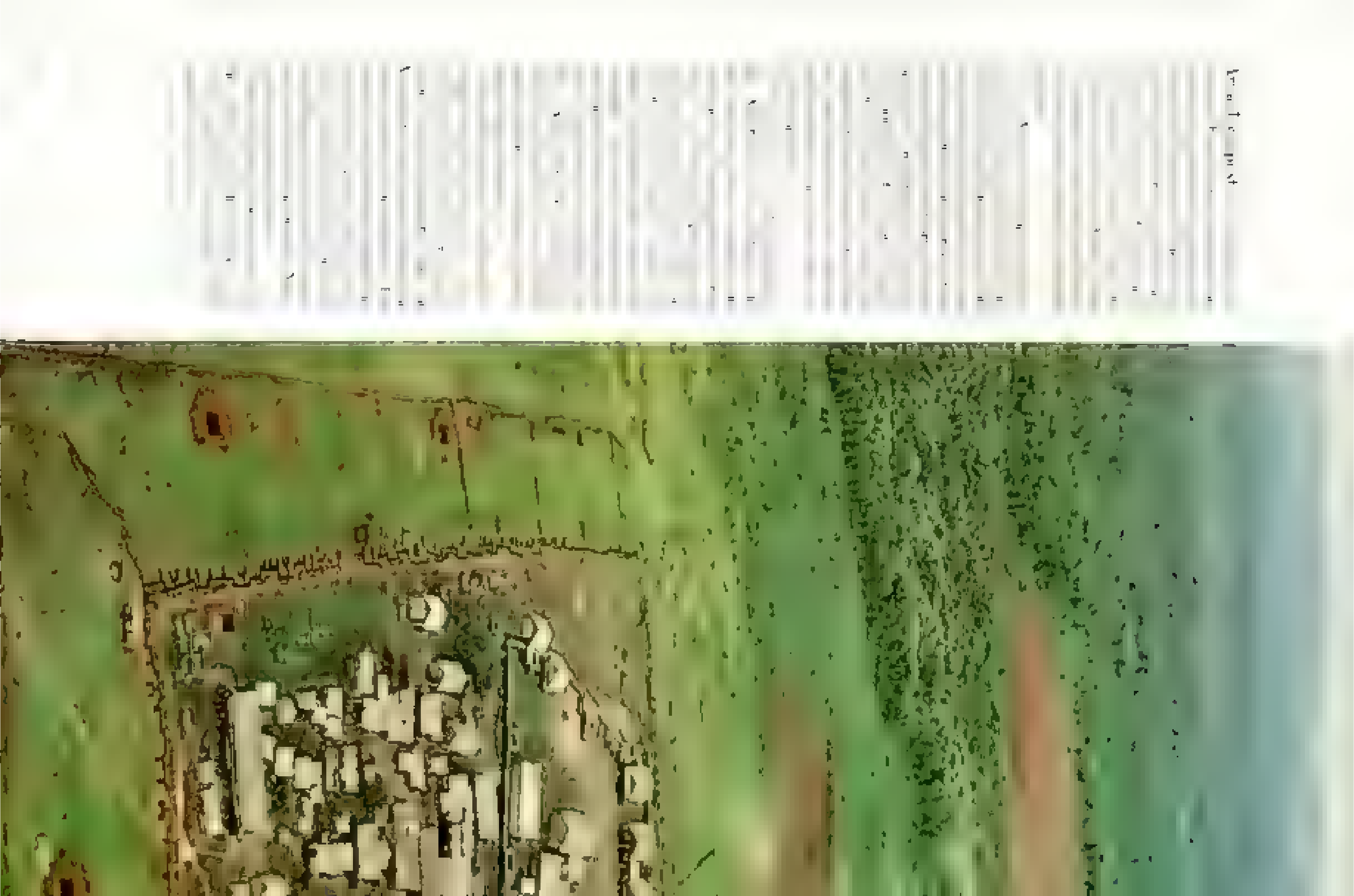
HOW COOLNESS AND CHARACTER WERE IN BLOOD

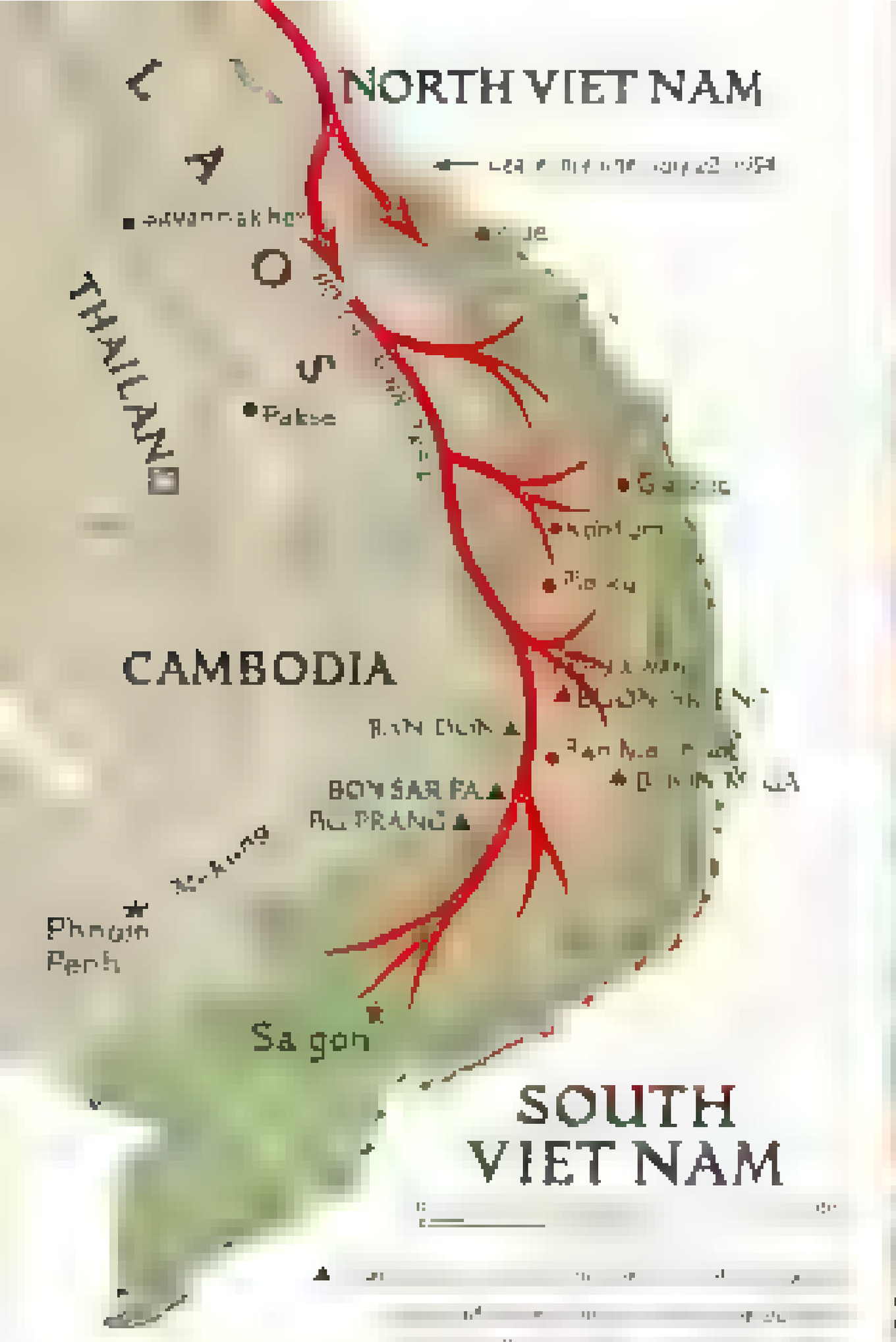
Article and photographs by
HOWARD SOCHUREK



in Action in Viet Nam

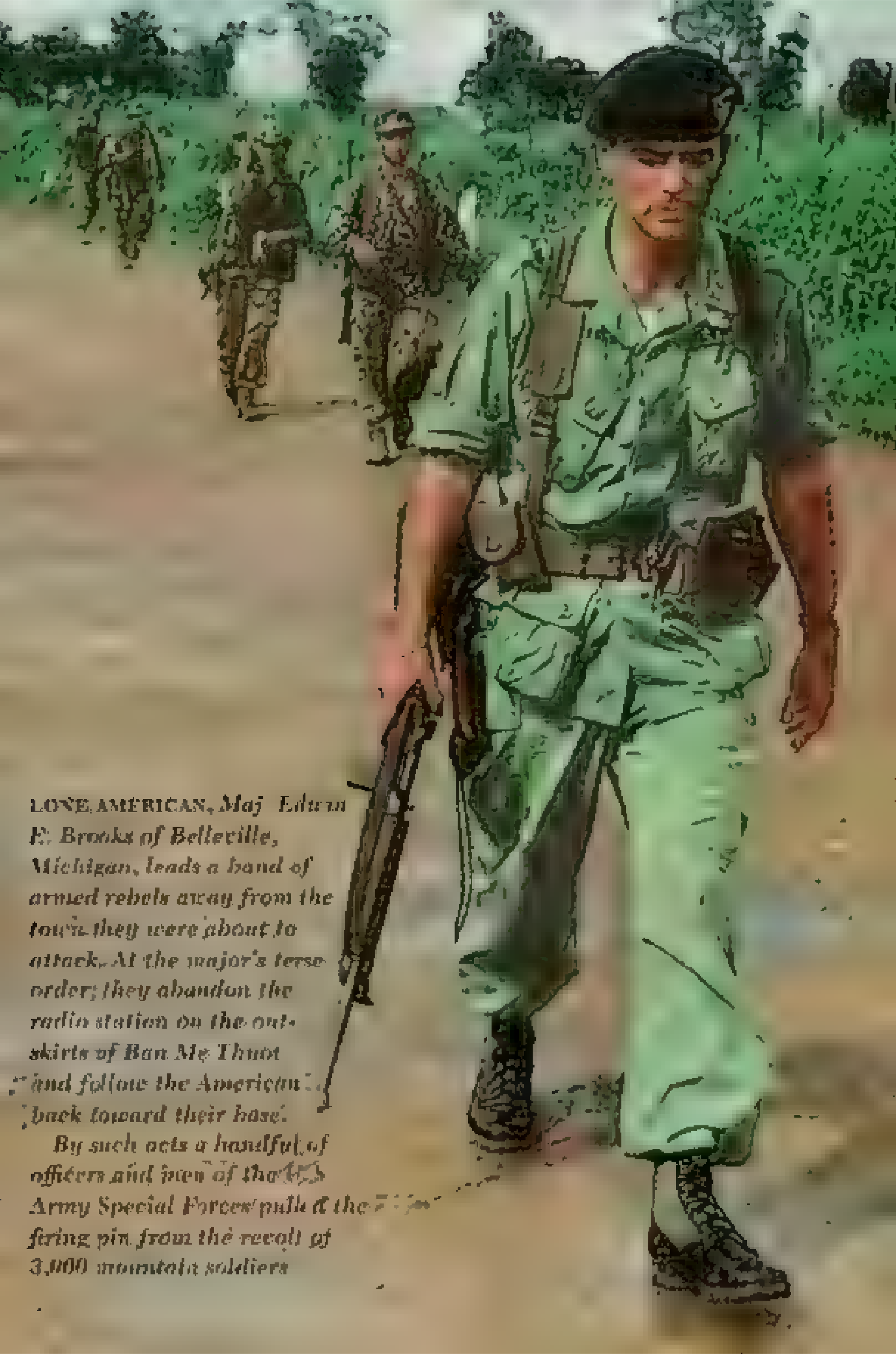
BATTLE WHEN MOUNTAIN TRIBESMEN ROSE IN REVOLT





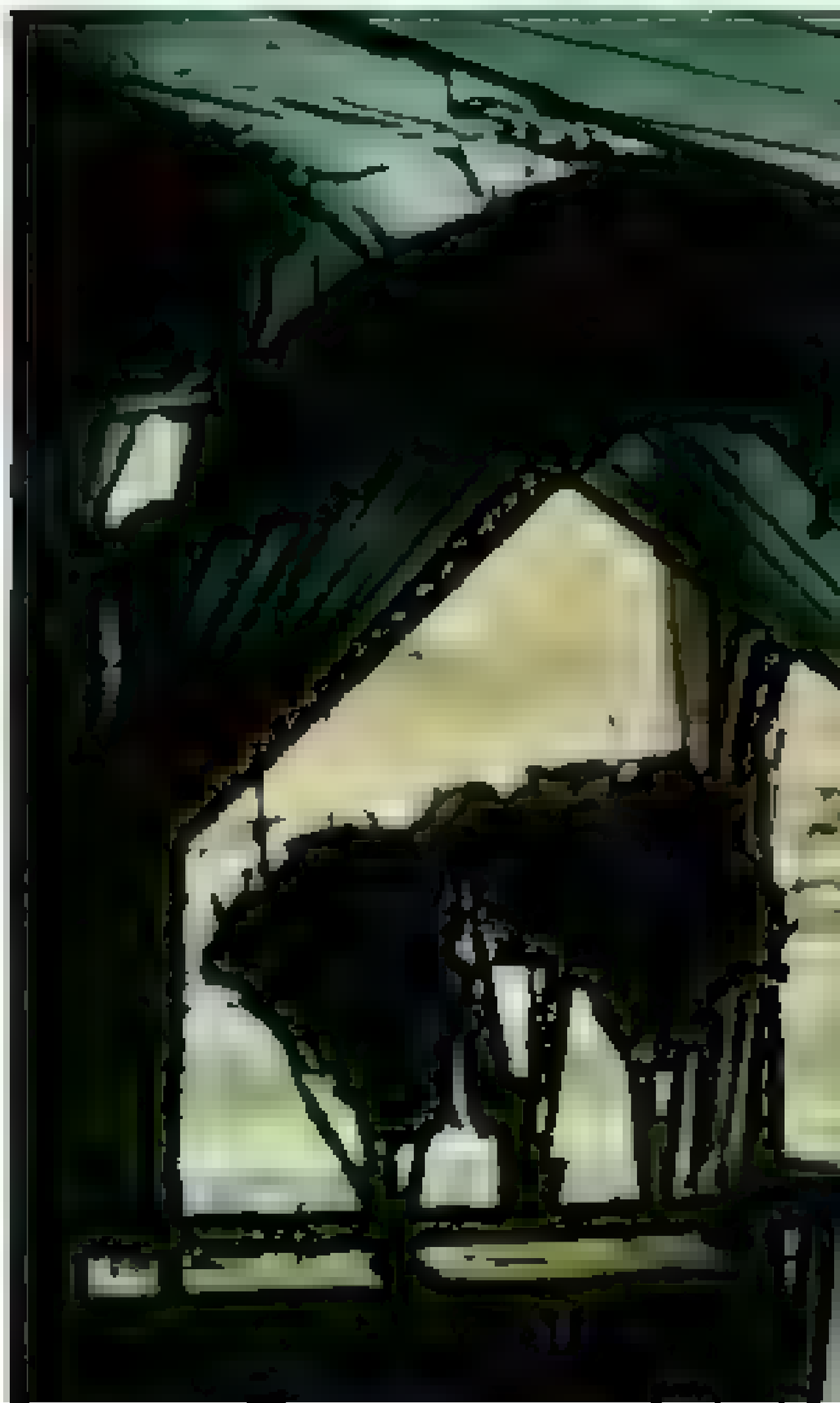
SPECIAL MAP SUPPLEMENT

Review Constant Dance



LONE AMERICAN, *Maj Edwin E. Brooks of Belleville, Michigan, leads a band of armed rebels away from the town they were about to attack. At the major's terse order, they abandon the radio station on the outskirts of Ban Me Thuot and follow the American back toward their base.*

By such acts a handful of officers and men of the U.S. Army Special Forces pulls the firing pin from the recoil of 3,000 mountain soldiers




U S AIR F

Lone Soldier Saves Force Montagnard

When Y[illegible] Thon introduced C[illegible] [illegible] stated "The Rested Scouts is the fathest of the [illegible] and we are [illegible] When there is [illegible]

[illegible] Thon [illegible]

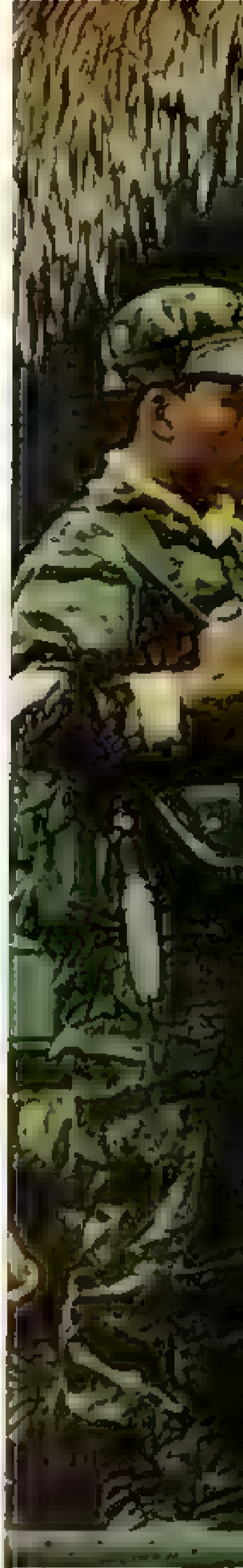
As [illegible] stepped forward, the [illegible] turned to attention. He put them at ease. A [illegible] at his [illegible] [illegible] be heard of the Americans [illegible]

[illegible]

Americans, we will fight the [illegible] I wanted. Strong we was, I th[illegible]

Divine Intervention [illegible]

[illegible]



going down to see them. We've got to get them turned around."

The three of us joined him. The people's and Vietnamese Army units—part of the permanent security force of Bien Hoa—formed up to resist the rebel attack. I thought of how lonely an affair this will be if it becomes.

At the radio station, Brooks walked from the jeep. A dense field of knee-high grass surrounded the two-story cement building. Rows of trees, in camouflaged jungle green, had sprouted along the fence. They trained their automatic weapons on the major and me.

Alone, Ed Brooks advanced toward the building. Soon, he strode to the center of the rebel perimeter. He could have been shot at any moment. But not a man moved. Brooks motioned Y Jhon to our side. I marveled at his calmness. This was truly courage.

He sometimes, the rebel position he came and explained, as Y Jhon interpreted, that the war was over. They were to return to their units. Soon he raised his right arm over his head in the military signal, "Follow me."

Insurgents Trail American "Pied Piper"

Troops behind him down the road that led out of the station, the rebels filing in groups following him. He was like the Pied Piper of Hamelin. What an incredible sight. Scores of fierce soldiers, armed to the teeth, walking out of the wall and leaving behind one American in jungle dress.

At the station gate, we had breakfast. Brooks ordered the desperados get trucks for the troops from wherever he could, as soon as he could. Brooks knew that if he could keep these troops from looting, he would win. And so he waited on. I waited with him. As we marched, Brooks sent word to other units of the rebellion the roadside. They fled.

Soon a jeep carrying one of our Vietnamese officers stopped in front. This told Brooks that the rebels had set up a command post six miles down the road. What did he do? There he dealt with the rebels.

Leaving the officers to direct the evacuation, we drove on. Brooks drove to the rebel command post. Two hundred yards marched [illegible]. As we approached, they opened [illegible] fire enough for the press to see [illegible].

The rebel leaders, a dozen, were standing before to watch the attack on the press [illegible]. Lounging in the shade of green [illegible] and their heavy weapons, I asks myself again: "What am I doing [illegible]?"

[illegible] I wondered if I would ever get out of [illegible].

As we searched for the leaders, a truck arrived carrying a fresh contingent of Vietnamese [illegible]—many young village [illegible]. Soon after, Captain Gillespie and Y Jhon arrived with the three truckloads of montagnards. Brooks had persuaded to leave the radio station.

Just then Brooks noticed the ancestors on the balcony of a mountainous house. Their hard faces drained of color. Wayne their pistols. They stood dejected at the returning troops—furious at this frustration of their plans. Brooks said, "Let's give them a little time to cool down." He sat down in the center of the compound.

As Gillespie walked from his truck, he [illegible] the Vietnamese captives, secured [illegible].

[illegible] Gillespie [illegible] walked over, drew his knife, and started cutting their bonds. Y Jhon, at his side, helped him. A special forces surgeon, Capt. Richard Hasker of Des Moines, Iowa, [illegible]. A few rebels threatened Gillespie with their [illegible] weapons, but he [illegible] away [illegible].

When he had finished, Gillespie addressed a rebel interpreter: "Why do you risk all these lives?" he demanded. "Don't you know you may all be killed?"

The interpreter stroked [illegible]. "If I die here the grass will be greener. The tree will grow taller and the land will be free."

As a jeepload of other rebel leaders came through the gate, Y Jhon's face twitched with fear in recognition. These men, he recognized, were Communist guerrillas from Cambodia. They disappeared inside a house at the center of the [illegible] and [illegible] the rebel leaders was already on inside for us.

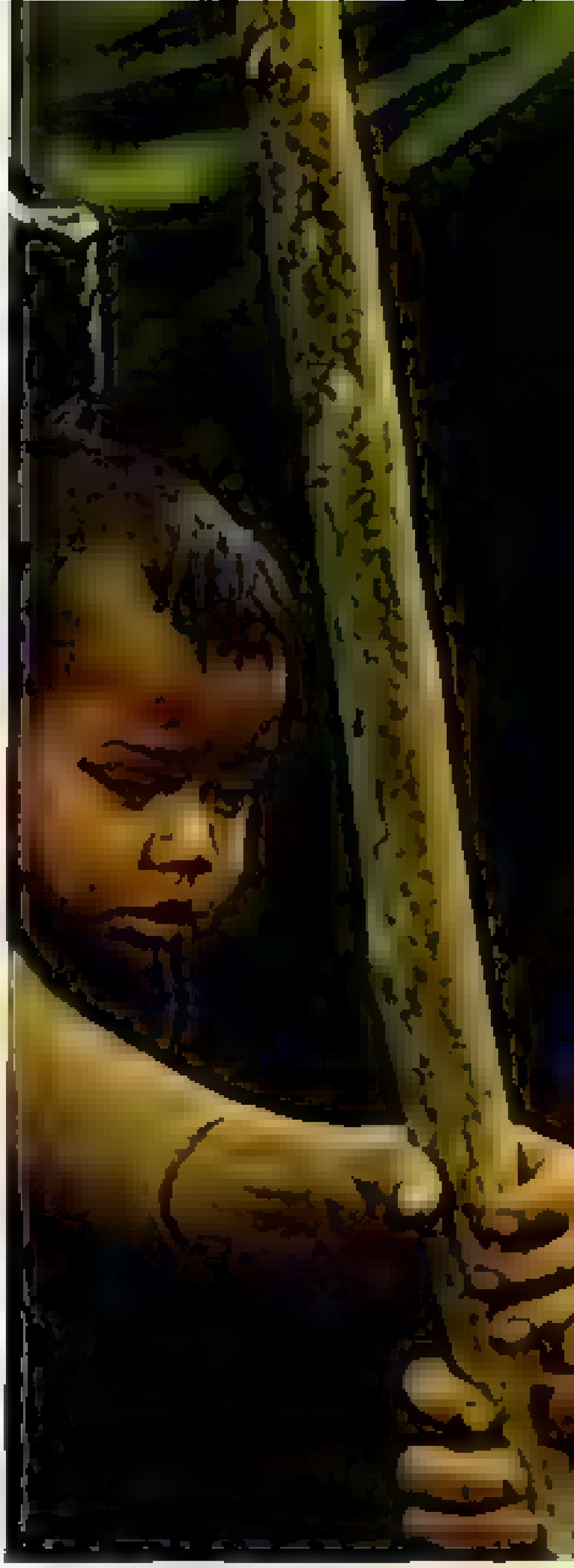
High Committee Lists Rebel Demands

Shaken by the events of the day, I decided not to leave this problem to the soldiers. I told Gillespie I would like to leave. He said, "We may [illegible] get out if [illegible]. The rebels are a [illegible] and [illegible] the story of the uprising to the world."

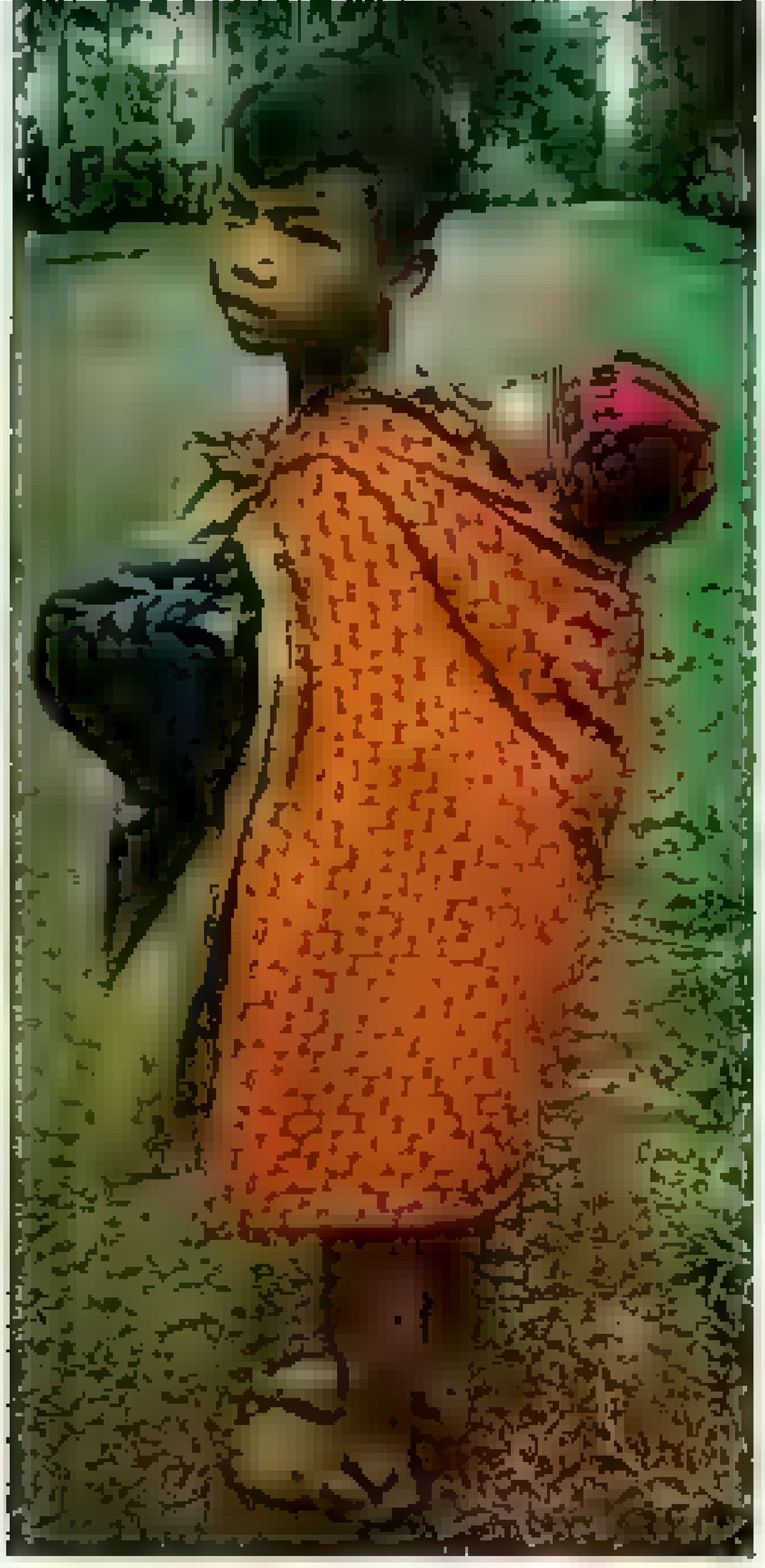
With rebel permission, I hopped aboard a messenger jeep and unmolested we headed back to Bien Hoa. There, [illegible] the moisture [illegible] the [illegible] and [illegible].

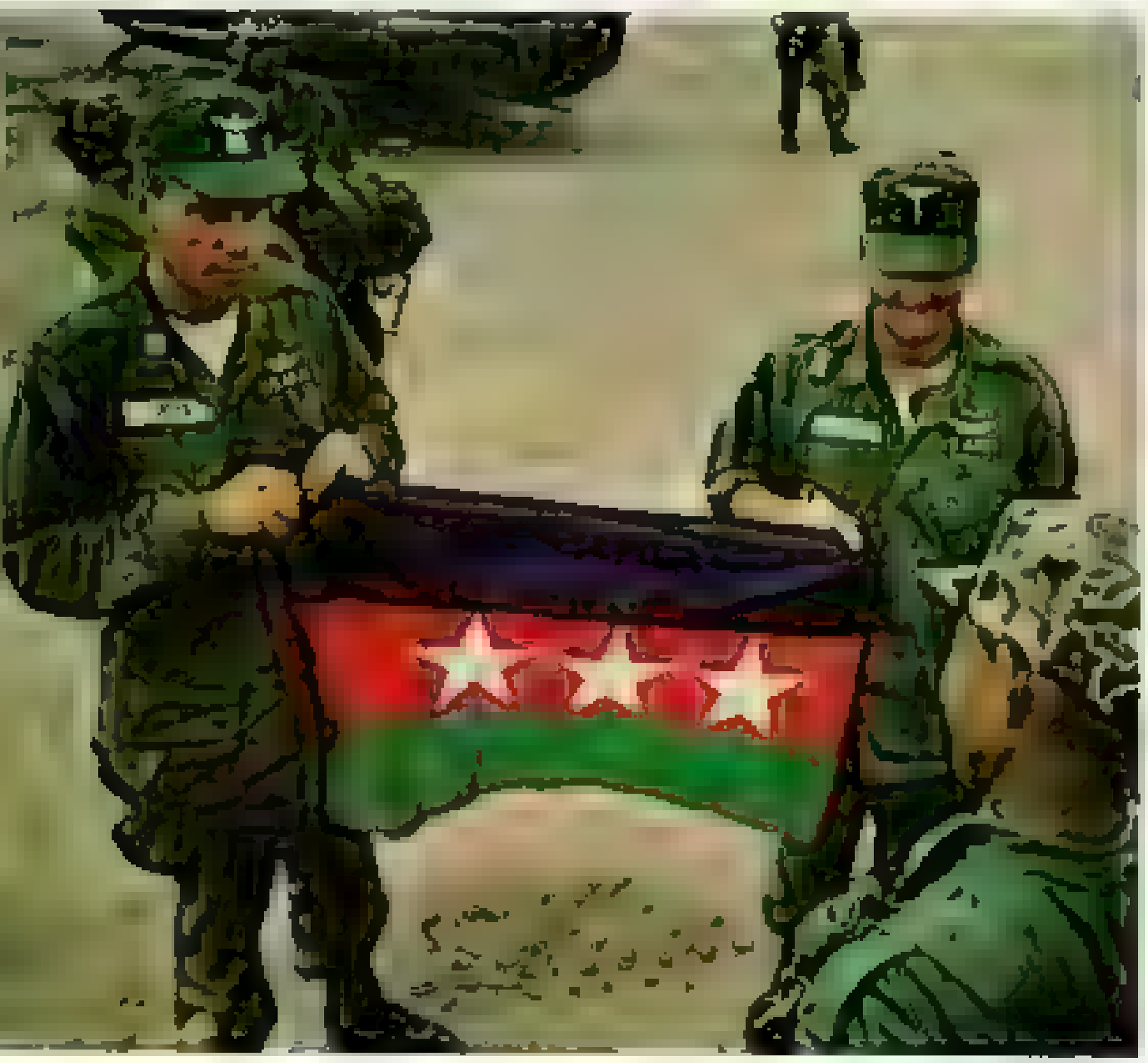
Once in the city, I checked on the news

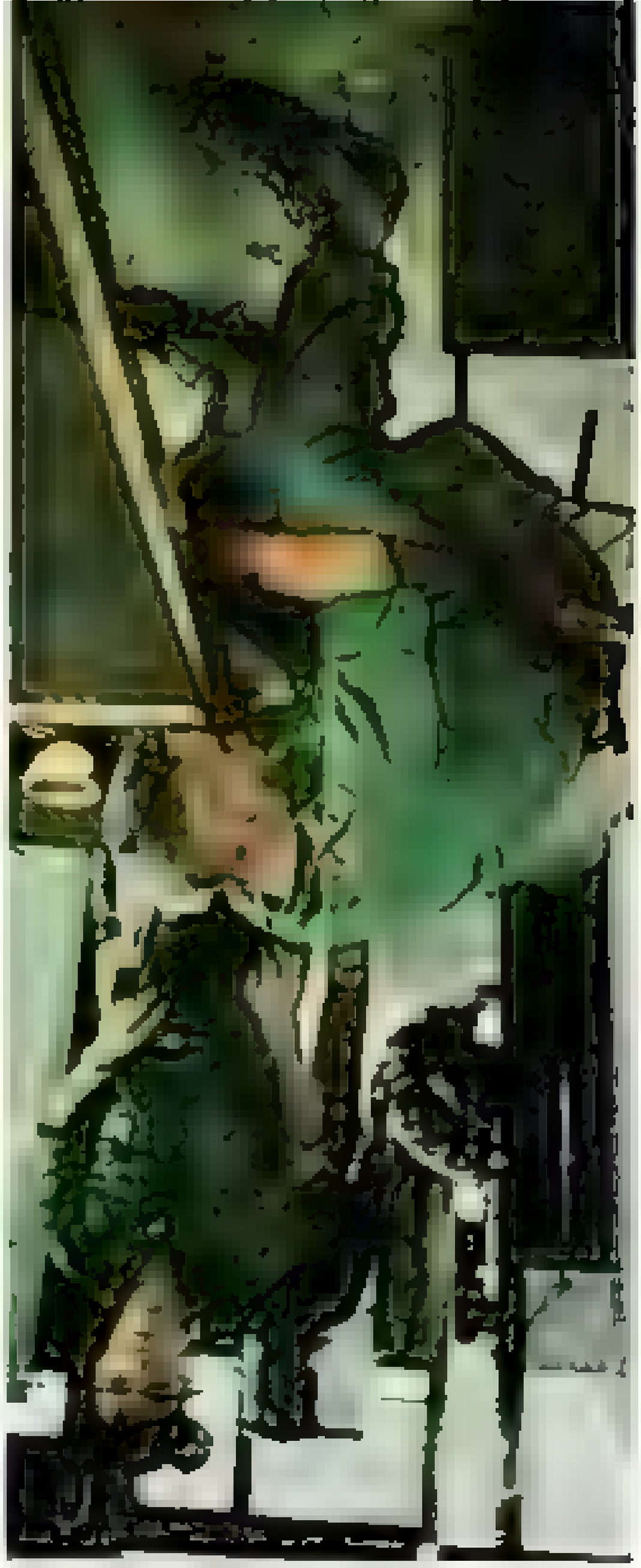
Monsoon Warfare: The Lines in a New Attack



Monsoon Warfare



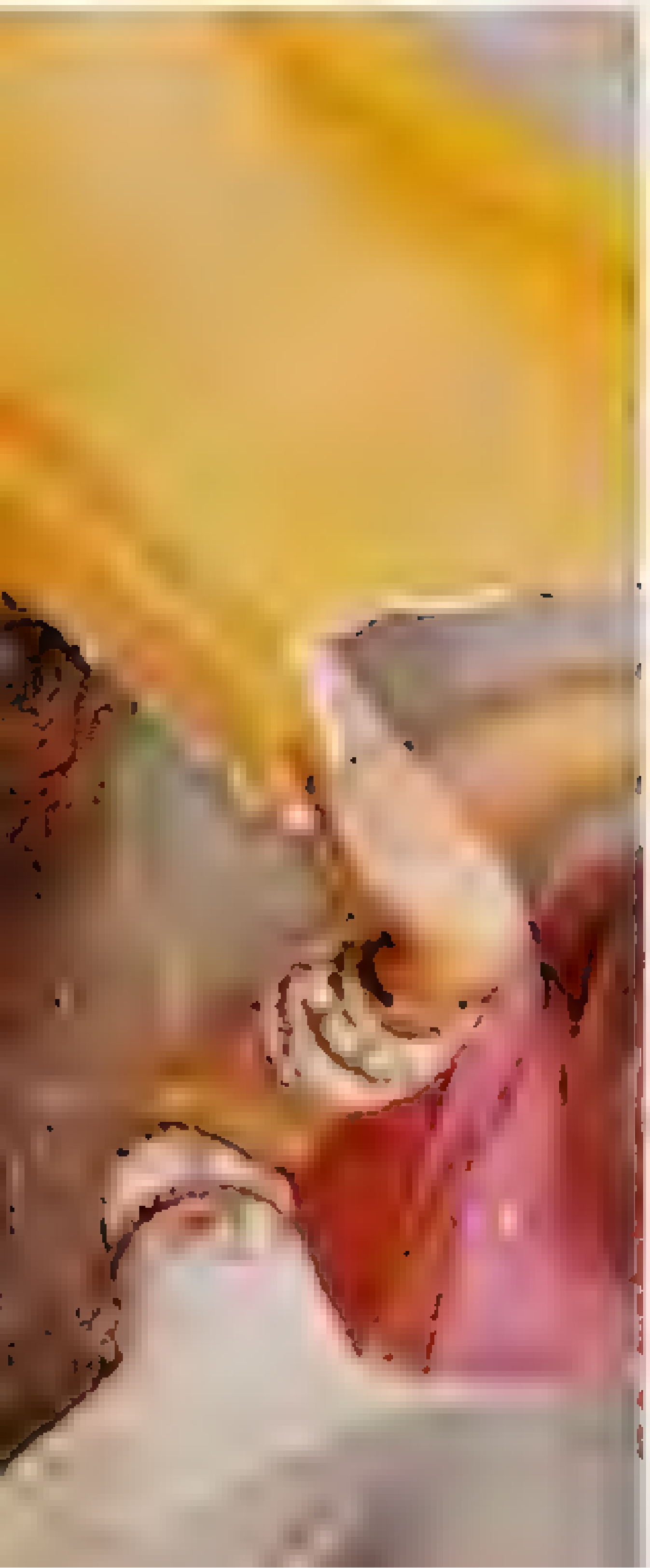


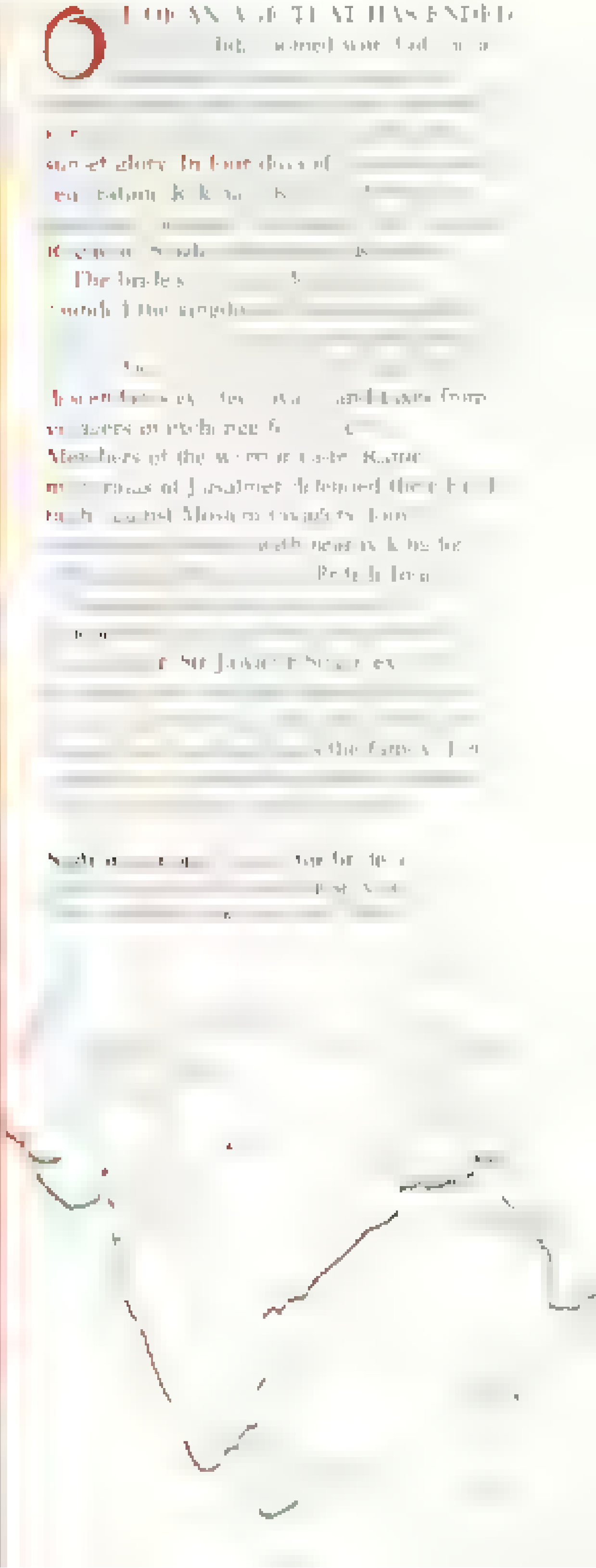


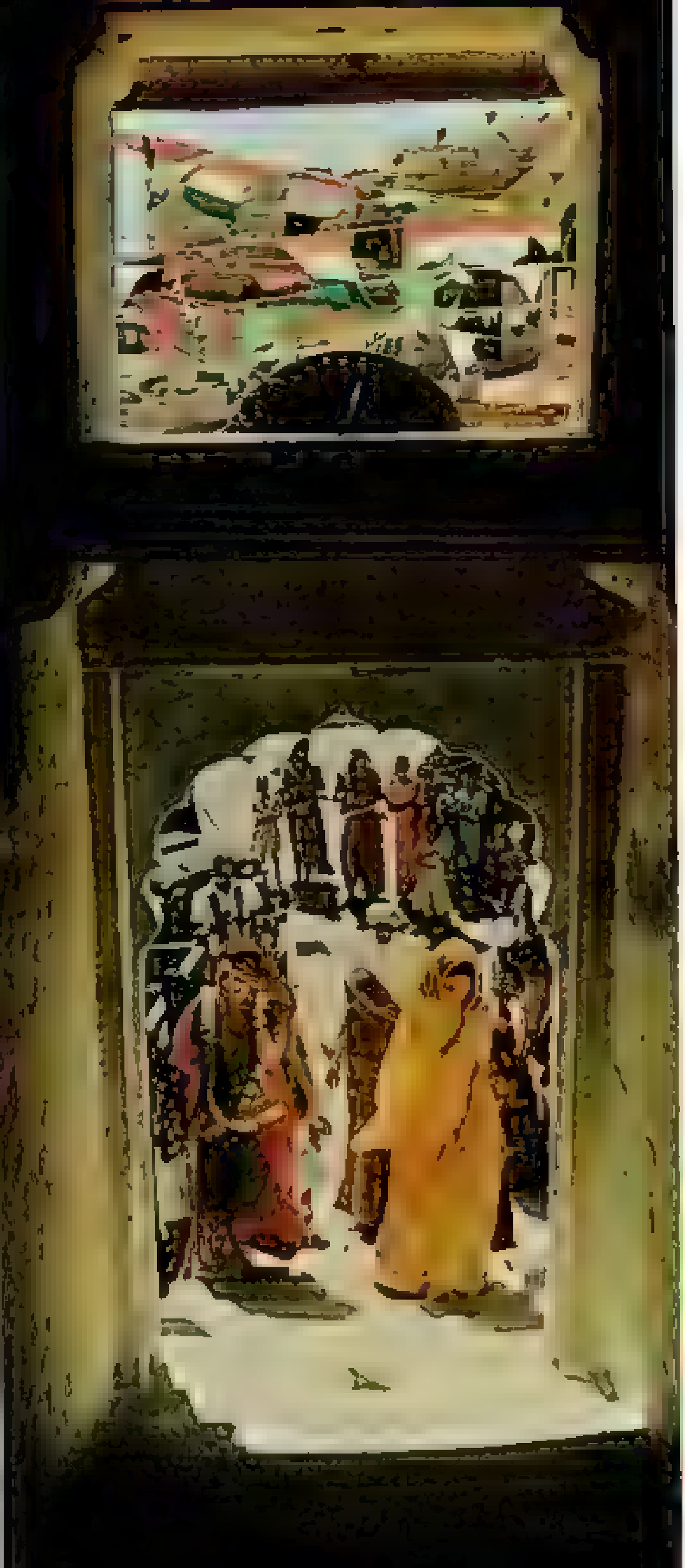
Royal Wedding at

Jaisalmer

Picture Story by
MARILYN SILVERSTONE

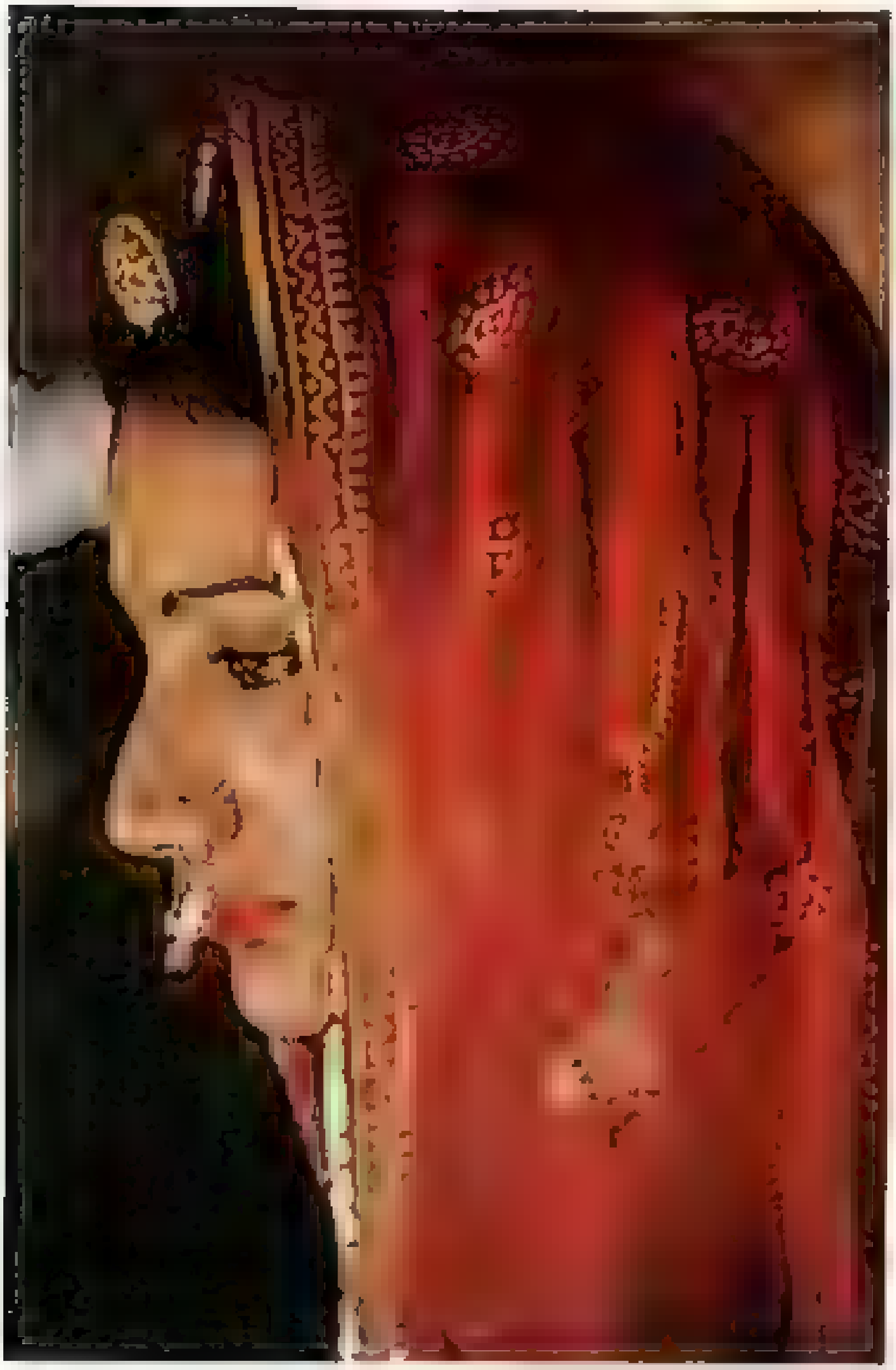






[illegible]

[illegible]



Profiles of the Presidents: The second of four articles

HISTORAMA

ANDREW JACKSON

Morning Mist

By FRANK FREIDEI

SEVENTH PRESIDENT 1829-1837

ANDREW JACKSON's inauguration in March, 1829, celebrated the coming into political power of a new America. Farms and plantations were spreading rapidly westward beyond the Mississippi River, newborn cities were revolutionizing commerce and manufacturing.

Countryside and cities alike stirred with ambitious men striving to improve their lot by overthrow under more aristocratic political and economic institutions. For President Jackson they found their hero and their spokesman. Jackson, in his rise from a Carolina log cabin to a Tennessee plantation home in Tennessee (page 87), applied their aspirations in his insistence that Americans should enjoy equality of opportunity. He voiced their credo.

More than any man of his predecessors, Jackson was elected by popular vote, and as President he acted as the chief representative of the common man.

Nine-year-old Shows Off His Learning

Jackson was born in Waxhaws, a backwoods settlement on the border between North and South Carolina in 1767, two years after his Scotch-Irish parents had emigrated from northern Ireland. His father died shortly before he was born. Jackson never [illegible] to read with pride that as a 9-year-old he had read a newly arrived copy of the Declaration of Independence to a group of illiterate frontiersmen.

At 13 he served as a messenger with American troops, surviving several skirmishes. Later, when he refused to polish a British officer's boots, he received a sabre blow on his head that scarred him for life. His mother died when he was 14. In his teens he read law and became a frontier lawyer, first in Jackson's hometown, Nashville, and later in the settlement of Nashville, and finally in Jonesborough, Tennessee. Jackson was noted for his physical courage and stubbornness rather than for his legal knowledge. Jackson commanded respect on the frontier. He rapidly established himself as one of Tennessee's outstanding young lawyers.

In many respects Jackson was uncouth, he could be violent—fiercely jealous of his honor, he engaged in brawls and in one duel, after a man had accused an unjustified slur on his wife Rachel (page 88).

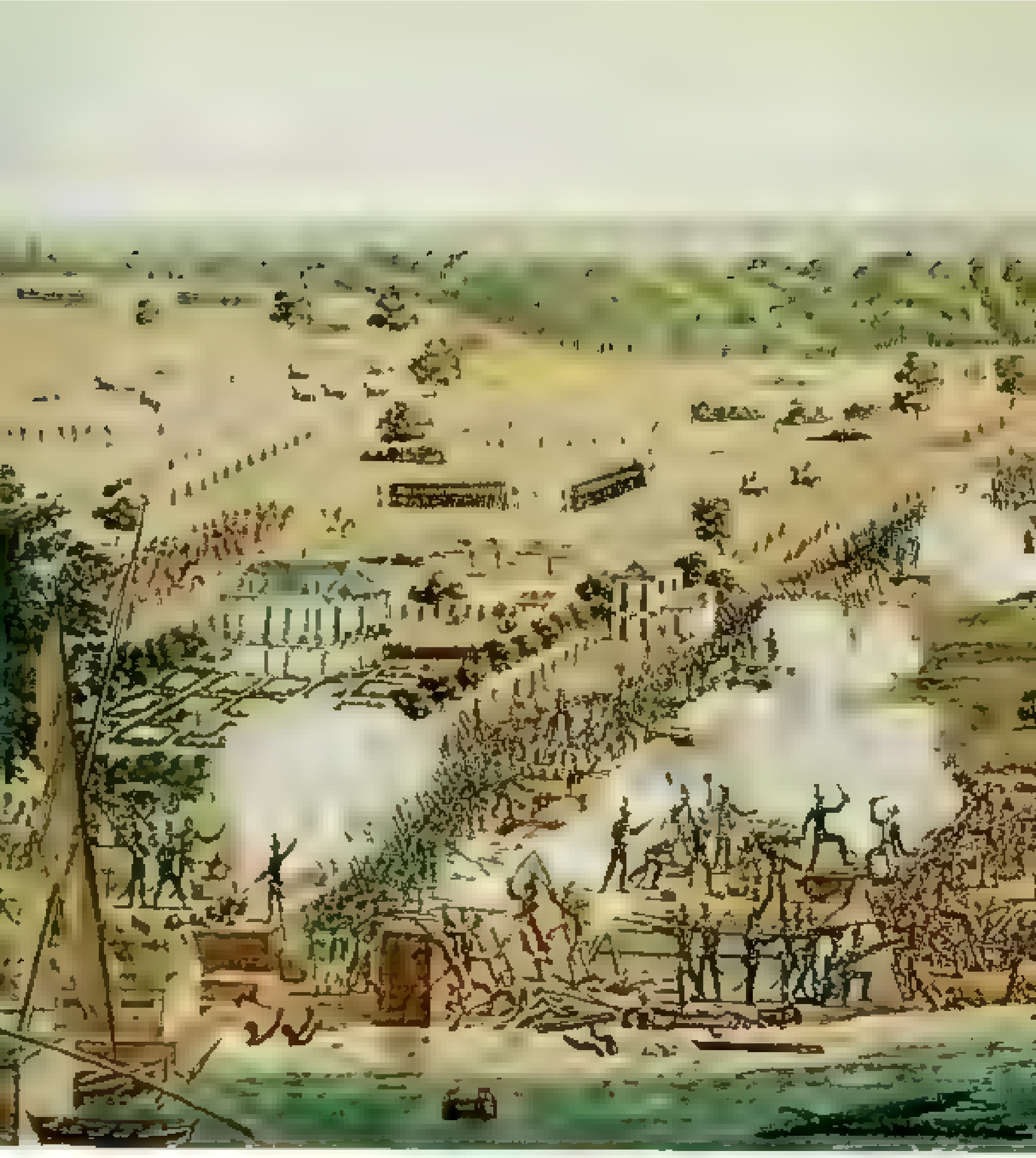
He speculated in land and asserted business ventures, loaning money to banks and eastern financial interests in lieu of cash, [illegible] sufficients to buy slaves, plant cotton and [illegible] speculate [illegible]. He was the first man elected from his state to the House of Representatives, served briefly in the Senate, and became a judge in Tennessee. As a practical and prudent to the law. In 1801 he was elected to be major general in the Tennessee Militia by the field officers.

Taking to the field despite a wounded arm, he punished the Creek Indians for their massacre of frontiersmen and, in 1814, received a commission as major general in the United States Army. Increasing and reorganizing its numerous regiments from the southwestern frontier, he beat back seasoned British troops that had earlier won victories under Wellington in Europe. Jackson's final triumph in the Battle of New Orleans, January 8, 1815, established him as the hero of a generation of Americans (pages 84–5).

Jackson Nearly Wrecks White House

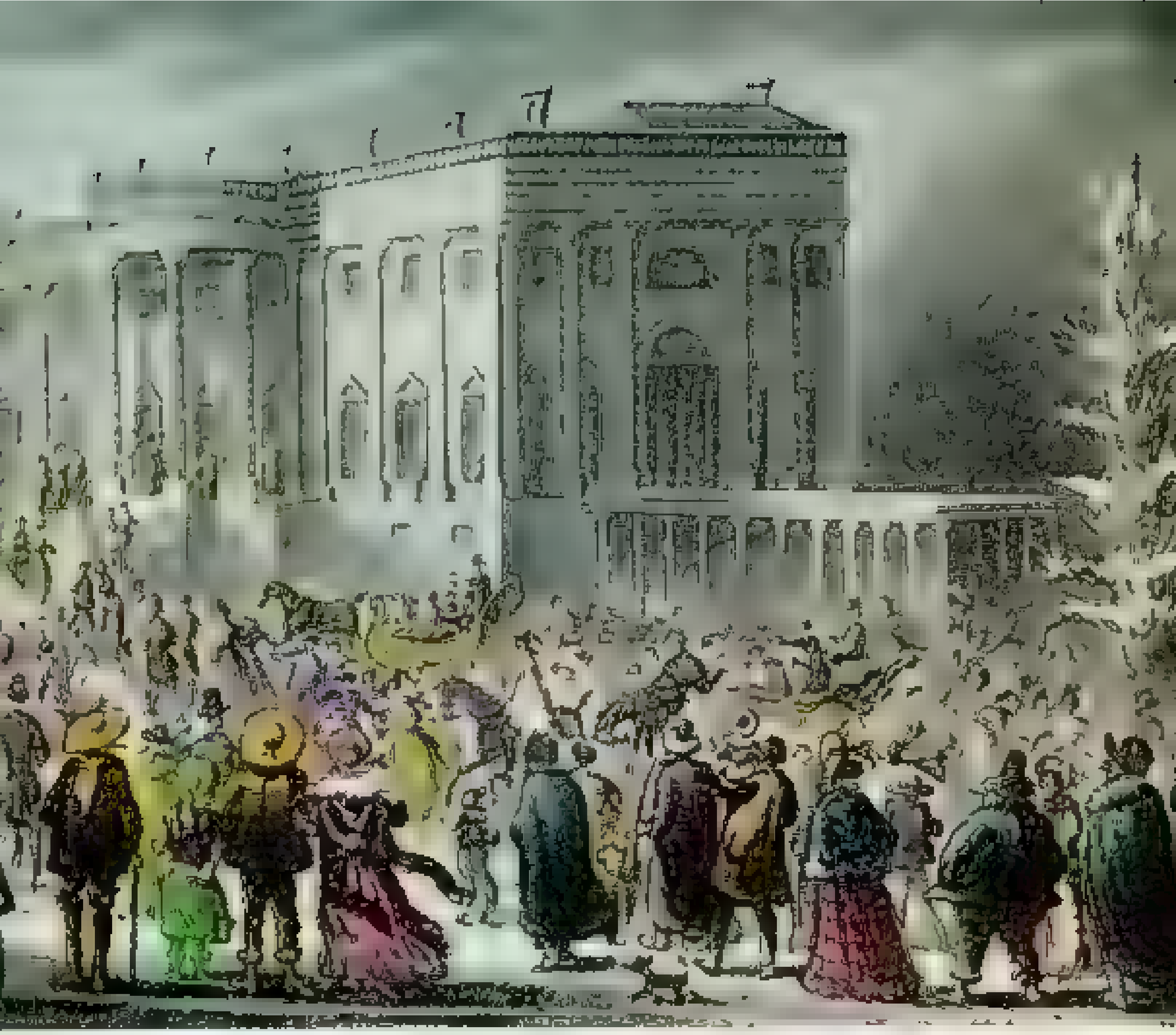
In the changing politics of the 1820s, as customs and laws changed, issues were obliterated as sectional lines, the increasing number of voters led to the founding of new-style parties and factions in state after state. A result, in 1824 some of these raised [illegible] candidates [illegible] Jackson [illegible] among their allegiance to [illegible] Jackson's [illegible] and [illegible] the broad [illegible] of the

Temperamental Andrew Jackson [illegible] the hearts of the people. John Quincy Adams demonstrated [illegible] a horseman of [illegible] [illegible] Jackson [illegible] [illegible] Jackson [illegible] another. He often fashioned [illegible] Congress. [illegible] [illegible] the Five in the Pre



Battle of New Orleans

Marion's horse-sack



[illegible] unanimously but more than this, changed [illegible] energy and dis[illegible]

[illegible] were divided to equal tenths both, and, as Heaver[illegible] and, Jackson jumped to his feet and ex[illegible]

[illegible] were in tune with the spirit of the Ameri[illegible] not tied to "the democratic [illegible]

[illegible] 6 percent of the popular vote and almost [illegible] ara's supporters and a force in the Democratic Par[illegible]

have taken as many electoral votes as Clay.

As a matchmaker, Jackson was [illegible]

[illegible]

[illegible] votes to rid themselves of a high [illegible] Clay's place. They hoped to win Jackson [illegible] their views, but at a Jefferson Day [illegible]

[illegible]

Van Buren Becomes Jackson Running Mate

[illegible] the White House is priceless. The President will [illegible]

[illegible] ure that "[illegible] were known ever." For that [illegible] later "Major General Jackson entered at the head of his company, tall, lank and [illegible] with [illegible] appearance. Seating himself near the fire his friends formed a group, [illegible] was [illegible] for some minutes scan[illegible] the face and form of [illegible]

[illegible] ered with thick gray hair that stood erect, a [illegible] though impregnated with his defiant spirit. His brow was deeply furrowed and [illegible]

Martin Van Buren

EIGHTH PRESIDENT 1837–1841

MARTIN VAN BUREN, the "Little Magician" [illegible] troubles than the allies of Jacksonian Democracy. Loyal to President Jackson, he continued faithfully the policies of his predecessor. For good measure, the Whigs defeated [illegible] he and his fellow Jacksonians had engineered [illegible]

Van Buren, born in 1782, was of Dutch descent [illegible] New York. [illegible] for his cleverness in debate. As a young lawyer, he [illegible] were, would bring to the support of [illegible] government of statesmanship, the zeal the virtuosity & the capacity." However, as leader of [illegible] New York [illegible] the proposal federal subsidies for internal improvements a position pleasing to his frontier friends, who were afraid the money would go to construct roads such as the Erie Canal. By [illegible]

Blue eyes twinkling and [illegible] whiskers flank a cherubic mouth, [illegible] Martin Van Buren [illegible] jokes with his chief lieutenant, Andrew Jackson. Washington [illegible] called him "one of the great men I have ever met with." He spoke softly and sometimes changed his mind. Enemies accused him of [illegible]. Van Buren urged: "To yield to necessity is the real triumph of reason." He was the first President born under the Stars and Stripes.

[illegible] President Jackson rewarded Van Buren by bringing him into the Cabinet as Secretary of State. As the members of the Cabinet appointed at Calhoun's recommendation began to demonstrate that they had only secondary loyalty to Jackson, Van Buren emerged as the President's most trusted confidant. Jackson referred to him as "my [illegible]."

Rumors Widen Rift in Cabinet

The rift in the Cabinet became serious because of Jackson's differences with Calhoun on a presidential appointment, but on the surface it developed over the coldness of Calhoun's wife and the wife of the Secretary of War, Peggy O'Neale Eaton. The belief of others by some to Jackson remembering the injustices that had afflicted his own wife, [illegible] between [illegible] of her [illegible]

The stalwart Cabinet became a nuisance to Jackson. Van Buren suggested a way out of the impasse. He and Mrs. Eaton resigned, causing the Cabinet men also to resign. Jackson appointed a new and loyal Cabinet and sent it to new [illegible] Van Buren by [illegible] him Minister to the Court of St. James's. Vice President Calhoun, as President of the Senate, cast the deciding vote against the appointment, and this a matter of Van

DEMOCRATIC TICKET.

FOR PRESIDENT,
MARTIN VAN BUREN
FOR VICE PRESIDENT
RICHARD M. JOHNSON

OHIO ELECTORS:
John M. Goodenow,
Otho Lonzer,
Jacob Fetter,
James B. Cameron,
David S. [illegible]

Democratic Log Roll of 1840 [illegible] Van Buren [illegible] Liberty and Equal Rights with a [illegible] Log Cabin. His position [illegible] earned him the nickname "Little Magician." [illegible] bankers and speculators [illegible] policy [illegible] of paper currency for private banks. The Whigs [illegible] for re-election [illegible]

Buren at the eyes of western Jacksonians, who had then had scarcely known of his existence. He was elected Vice President on the Jackson ticket in 1832 and nominated for the Presidency in 1836.

The Whigs tried to defeat Van Buren by running several candidates, each strong in his own section of the country, but Van Buren won 170 electoral votes compared with 124 for his four opponents combined. One of the Whig leaders, William H. Seward, exclaimed Van Buren's triumph: "The people are for him," Seward pointed out. "Not so much for him as for the principle they suppose he represents. That principle is Democracy."

In his Inaugural Address, Van Buren held up the American experiment as an example to the rest of the world. At that particular moment the experiment seemed highly successful, for the Nation had enjoyed unprecedented prosperity and serenity. But less than three months later the Panic of 1837 punctured the economic bubble.

The 19th-century cyclical economy of "boom-and-bust" was merely following its regular pattern, but Jackson's financial measures contributed to the crash. His destruction of the Second Bank of the United States had removed restrictions upon the reckless and inflationary practices of some state banks, which speculation in lands, based on easy bank credit, had swept the West. To put an end to this speculation, Jackson in 1836 had taken a deflationary step: he issued a Specie Circular requiring that lands be purchased with hard money—gold or silver.

Nation Wracked by Five Lean Years

In 1837 hundreds of banks and businesses failed. Unemployment became serious in towns and cities. Thousands of speculators lost their land. Railroad and canal construction almost halted, and several states temporarily repudiated their debts. For some five years the United States was wracked by the worst depression of its young history.

It did not occur to President Van Buren or his advisers that the Government should try to alleviate the crisis. They followed the policies that President Jackson had initiated. If these had any effect at all upon the depression, it was to deepen and prolong it.

Declaring that the panic was due to reckless business and overexpansion of credit, Van Buren devoted himself to maintaining the solvency of the Government. He wished the "money power" to be cut off completely from access to Federal funds, and opposed not only a creation of a new Bank of the United States but also the placing of Government funds in state banks. He fought for an independent treasury system to handle Government receipts and disbursements. He cut Federal expenditures so deeply that the Government even sold the tools it had used on public works.

Symbols of Luxury Led to Defeat

Despite his humble upbringing, Van Buren had developed a taste for elegance. He was only about 5 feet 6 inches tall, but trim and erect, and he dressed fastidiously. An observer seeing him attired for church one Sunday in 1828 described him in these words: "He wore [illegible] with [illegible] breast was strange with modest lace [illegible] his vest was of a pearl hue, his trousers were white duck, his shoes were morocco, his neatly fitting gloves were yellow kid, his long furred beaver hat with a brim of brown was [illegible] a Quaker cut."

As President, Van Buren rode in an olive-green carriage attended by liveried footmen and pulled by fine horses with silver-mounted harness. These symbols of luxury, including Van Buren's amiable accessibility, made him an easy target for the Whigs in 1840.

Out of office, Van Buren inclined more and more to oppose the expansion of slavery. Indeed, as President, he had blocked the annexation of Texas because it might bring war with Mexico and assuredness would lead to slave territory. In 1848 he ran unsuccessfully for President on the Free Soil ticket, and by the time of his death in 1862 had pledged his faith to Abraham Lincoln. The House of History in Kinderhook preserves mementos of Van Buren the man and the President.

Ninety-nine-step tower of Van Buren's Lindenwald estate at Kinderhook, New York, overlooks the lush valleys of the Hudson. Former President Van Buren, long nearly bankrupt, converted his farmhouse into a mansion and added the Italianate tower in the hope that his home of retirement would become another Monticello. It never did, and survives today in private ownership as "Old Kinderhook," abbreviated to "O.K.," because [illegible] anything that was all right.

NINTH PRESIDENT 1841

WILLIAM HENRY HARRISON [illegible]

[illegible] were him a national regard [illegible]

Short-lived President. [illegible]

When the Indians attacked Indiana's frontier settlements, upon Harrison fell the responsibility of defense. The problem came to a head in 1809 when an eloquent and energetic chieftain Tecumseh, together with his brother the Prophet, began to rally the tribes.

Harrison received permission in 1811 to attack. He marched with about a thousand men toward the Prophet's town. Suddenly

Still mourning ribbons [illegible]

Attack by Indians shatters the sl

[illegible]

[illegible] of the frontier and Indian fighter Davy C[illegible] [illegible] Fabrina, he said, [illegible] crust to the assistance of Van Buren, a[illegible] to hang himself with [illegible] hammerhe [illegible] [illegible] of the campaign of the Whig [illegible] was a small white paper ba[illegible] [illegible] like "Keep [illegible] [illegible] to Washington." By [illegible]

Proconsuls Killed "as Dead as Smelts"

When Harrison arrived in Wash[illegible] [illegible] general Congress [illegible] with closed a[illegible] [illegible] Webster succeeded in [illegible] [illegible] boasting in a [illegible] [illegible] and killed "seventeen Roman proconsul[illegible] [illegible] as smelts, every one of [illegible]

We later had reason to be glad for Harrison, based on his Inaugural that [illegible] be obedient to the will of the people as ex[illegible]

He said of the Constitution "I can not con[illegible] [illegible]

[illegible] part of the legisl[illegible] [illegible] As [illegible] interest [illegible] use that a [illegible] for a moment have been [illegible] [illegible] better [illegible] the wants and wishes of the people than the [illegible] representatives, who spent a [illegible] year [illegible] were bound [illegible] the time for interest, date and [illegible]

Those in Congress were confident that [illegible] President would accept their judgment, he [illegible] Congress to meet in special session on May 31. If it were he had been in office [illegible] three weeks, he could [illegible] that develop[illegible] into pneumonia. On April 4, 1841 [illegible] [illegible] Whig prom[illegible]

John Tyler

THE PRESIDENT [illegible]

JOHN TYLER was the first Vice President [illegible] death of his predecessor. His detractors claiming that he should [illegible] ing President, dubbed him "[illegible]

[illegible] a more urgent and [illegible] momentous precedent, by insisting that he had succeeded to the full powers of his office. He vetoed the states' rights course [illegible] himself a President without a party.

Born in Virginia in 1790, the son [illegible] of Jefferson's friends and [illegible], he was reared believing that the constitutional [illegible] powers to the Federal Government [illegible] security or harmony [illegible] He never swerved from this conviction.

Tyler attended the College of William and Mary and later studied law. Serving as the House of Representatives from 1816 to 1821, he voted against most of the [illegible] measures of the time. After leaving the House he served two terms as Governor of Virginia. Later as a Senator, he [illegible] supported Jackson for President [illegible] of events, but [illegible] moved towards the Jeffersonian [illegible] and the [illegible]

Tyler soon became [illegible] of the states' rights [illegible] in Congress [illegible] Clay, Webster and the [illegible] Party in opposing President Jackson. He resigned as Senator in 1836 rather than follow the instructions of the Virginia Legislature that he vote to expunge a Senate resolution censuring Jackson. In Congress he was [illegible] a Whig, and even though he disapproved of Clay's nationalistic programs, he remained a personal friend of Clay.

Tyler's Name Lures Southern Votes

Thus the Whigs nominated Tyler for Vice President in 1840, hoping that his name would bring to the polls southern states that [illegible] who could not stomach Jackson's Democrats. The slogan "Tippecanoe and Tyler too" [illegible] waving naval victory plus a slap [illegible] Southern sentiment.

Clay [illegible] among to keep party leadership [illegible] his own views during the campaign. Webster proclaimed himself a Jeffersonian Democrat. With the party [illegible] with disaffected [illegible] and [illegible] the President-elect, "Old Tippecanoe" was a bit disturbed, but agreed [illegible]

Man without a party, John Tyler [illegible] his [illegible] Vacation [illegible] The [illegible] joined the first [illegible] [illegible]

[illegible] Texas [illegible] to a troubled [illegible] His veto of a bank [illegible] [illegible]

Jugged metal [illegible] [illegible]

Whoever, aged [illegible] independence Rock [illegible]

[illegible] transcle-
[illegible] possible the Sweet
water River [illegible] the rock [illegible]
[illegible] west from Casper Wy
[illegible]
[illegible] Webster
[illegible]

Webster as Secretary of State and Last Days of the Cabinet

[illegible] Le Caine
Suddenly President Harrison was dead and
Tyler Two in the White House. He [illegible]
[illegible] assuming the full powers and privileges
of a President rather than merely [illegible] the
prerogative [illegible] "Acting President." He even [illegible]
[illegible] Whigs [illegible]
further. Tyler [illegible] Harrison's Cabinet
[illegible]
[illegible] executive [illegible]
removal of the deposits from the Bank of the
United States. Whigs were opposed to this
Tyler would consequently accept [illegible]
program. Tyler soon were disillusioned.

Webster asked the President as Tyler's
[illegible] whether he intended to
continue Harrison's procedures. When Tyler
[illegible] Webster [illegible]
[illegible] agreed that all Cabinet meetings
[illegible] were "to be recorded by the [illegible]
by 10 votes, each member of the Cabinet
[illegible] the President having [illegible] votes. Tyler
[illegible] "I as President shall [illegible]
[illegible]

When Senator Clay [illegible]
[illegible] had been [illegible]
during the campaign. Tyler interpreted [illegible]
[illegible]
the [illegible] but Clay would not
budge. He [illegible]
but the President [illegible]
but accept Tyler's [illegible]
Tyler vetoed Clay's bill to establish a national
bank with branches in several states. A second
bank bill, similar to the first, passed
Congress. "I will never have [illegible] before me," Clay
vowed. But again the President vetoed it.

First Impeachment Attempt Fails

In retaliation, the Whigs expelled Tyler
from their party. All of the Cabinet resigned
but Webster, who suspected Clay's hand in
the dissolution of the Cabinet and detested
the Senator's ambitions for power. Webster
therefore, stayed on as Secretary of State and
Tyler, who had no intention of apologizing,
[illegible] replaced his Cabinet [illegible]

[illegible] when Tyler [illegible]
impeachment resolution against a President [illegible]
was [illegible] in the House of Representatives
was for the first time in American history.
A committee headed by Representative John
Quincy Adams reported that the President
[illegible] had exercised executive power but the resolution
[illegible]

Despite their differences, President Tyler
and the Whig Congress enacted considerable
positive legislation. In the interest of western
settlers, the President in 1841 signed the Log
Cabin Bill, which enabled a settler to claim
160 acres of land for use. It was [illegible]
only for states and [illegible] for a price of $1.25 an acre.
In foreign affairs, the Webster-Ashburton
Treaty settled a dispute between the United
States and Great Britain over the Canadian

[illegible] Texas was [illegible]

[illegible] Texas [illegible]

[illegible] Hos [illegible] eyes were [illegible]

Ex-President Helps Create Confederacy

[illegible] the secession [illegible] Civil War

Five Whigs resigned [illegible]

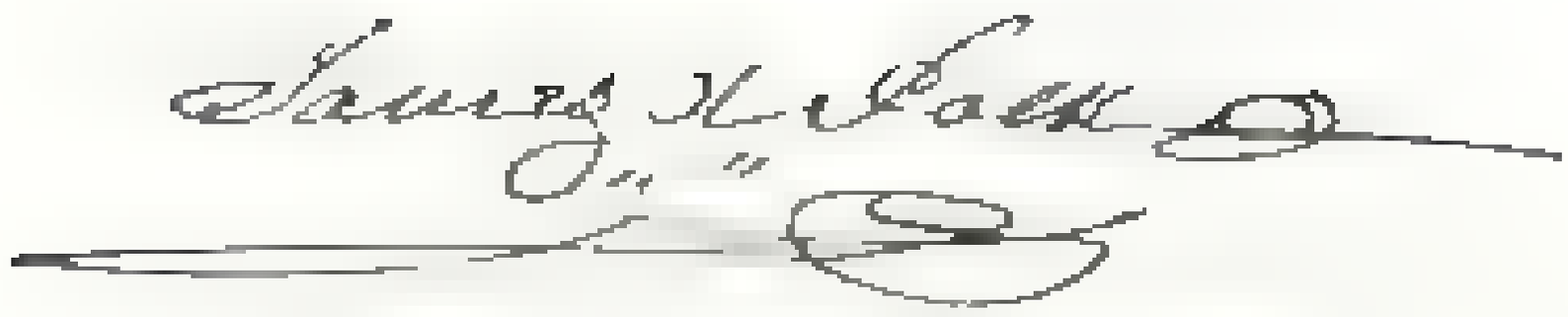
[illegible] Thereafter [illegible]

[illegible] Secretary of State [illegible] Democratic Party. [illegible]

[illegible]

When the first secession [illegible] Texas in 1861, Texas [illegible] the Southern Confederacy. He [illegible] election to the Confederate House of Representatives [illegible]

[illegible] Texas [illegible]



[illegible]

IN ADDITION TO HIS SUCCESS in fulfilling campaign promises, James K. Polk was one of the most [illegible] of Presidents. He ran in 1844 on a strong Manifest Destiny expansionist platform, but [illegible] left the White House in 1849, the Stars and Stripes flew from San Diego Bay to Puget Sound.

Polk, often referred to as the first "dark horse" President, was [illegible] as unknown as his Whig opponents wished voters to think. Some he had served four years as Speaker of the House of Representatives. Last of the Jacksonians to sit in the White House, and the last strong President until Lincoln, he was the first to use [illegible] war in all its phases. Still, due to the recent Mexican War, he is rated as Commander-in-Chief.

Polk was born in Mecklenburg [illegible] North Carolina, in 17[illegible]

[illegible] great grandfather [illegible] great uncle, in 1818 with top honors from the University of North Carolina.

As a young lawyer he entered politics and [illegible] served in the Tennessee Legislature. He became a friend of Jackson. In the House of Representatives, Polk became [illegible] Old Hickory's [illegible] Indian wars, and [illegible] leader between 1835 and [illegible] entered the heyday of Davy Crockett and Sam and Jackson. Rising in the House, Congress, he became Speaker of the House.

[illegible] Polk was [illegible] he was a leading contender for the Democratic vice-presidential nomination for Vice President in 1844. But Martin Van Buren, who had been expected to win the Democratic nomination and Clay, who was to be the Whig nominee, [illegible] to the annexation of Texas. Polk, who was [illegible] which asserted that Texas should be "annexed" and all of Oregon to "protect and

Jackson, [illegible] political [illegible] of the Democratic Convention, [illegible] sensed that the electorate favored [illegible] expansion. He urged the nomination of a candidate committed to the Manifest Destiny. At the Democratic Convention, [illegible] deadlocked, Polk was nominated on the ninth ballot.

"Who is James K. Polk?" jeered the Whigs. Jackson answered in a widely published letter: "[illegible] for business, his great and extraordinary powers of labor, both mental and [illegible], he proves that tact and judgment which are requisite to the successful administration of such an office."

Voters Attracted by Expansionist Aims

What finally elected Polk was the fact he stood for expansion. Linking the Texas issue, popular in the South, with the Oregon question, active in the North, [illegible] to be the measures of his administration, President Polk told George Bancroft, the historian, shortly after his inauguration, "one a reduction of the tariff, another, the independent treasury, a third, the settlement of the Oregon boundary question, and, last, the acquisition of California."

Taking firm command of both his Cabinet and the Democrats in Congress, [illegible] goals. The first was the Walker Tariff Act, and the Independent Treasury Act, passed by Congress in [illegible] 1846.

The other two, however, absorbed Polk's years as President. Before [illegible] Congress passed a joint resolution offering annexation to Texas, thus beguiling Polk. The [illegible] of war with Mexico [illegible] In his strong [illegible] Congress seemed to be risking war with Great Britain also. The population of thousands of

First dark-horse President, James Knox Polk [illegible] [illegible] Nashville [illegible] Polk [illegible] Mexican War [illegible] Polk [illegible] other Americans [illegible] August [illegible] 1846 [illegible]

Leonard Gray miners search for gold in a stereoscopic engraving, 18[illegible] metal satchel [illegible]

[illegible]

[illegible] from [illegible]

[illegible]

[illegible]

[illegible] Mexico as much [illegible]

[illegible] Americans [illegible] for California and New


GLIDDEN & WILLIAMS' LINE
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To Sail on or before THURSDAY March 11th.
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Z. Taylor

TWELFTH PRESIDENT 1849–1850

ZACHARY TAYLOR, acclaimed for his military victories in the Mexican War, was elevated to the White House in 1849, and as President had to grapple with the acute political problems the [illegible] had helped create.

Northerners and southerners disputed sharply whether the vast territory wrested from Mexico should be opened to slavery, and some southerners even threatened secession. Seasoned from "Old Rough and Ready" was prepared to hold the Union together by armed force if need than propose a compromise that would be disapproved. In the summer of 1850 as he faced this issue, he suddenly died.

From his background, Taylor would have seemed likely to become a southern statesman. Born in Virginia in 1784, he was taken as an infant to Kentucky and raised on a plantation. He was a career officer in the Army, and his task was most often of combating Indians. He was in Jefferson Davis's family and he owned a plantation in Mississippi.

Being a slaveholder did not make Taylor a defender of slavery or of southern aspirations. Rather, his forty years in the Army imbued him with a strong nationalist spirit. He received a commission in the Regular Army in 1808 and served there fighting the frontiers against Indians, during the War of 1812, in the Indiana Territory during the Black Hawk War and in Florida during the struggle against the Seminole Indians and escaped Army scars. In the Mexican War, using much the same type of tactics he had employed against the Indians, he won victories at Monterrey and Buena Vista.

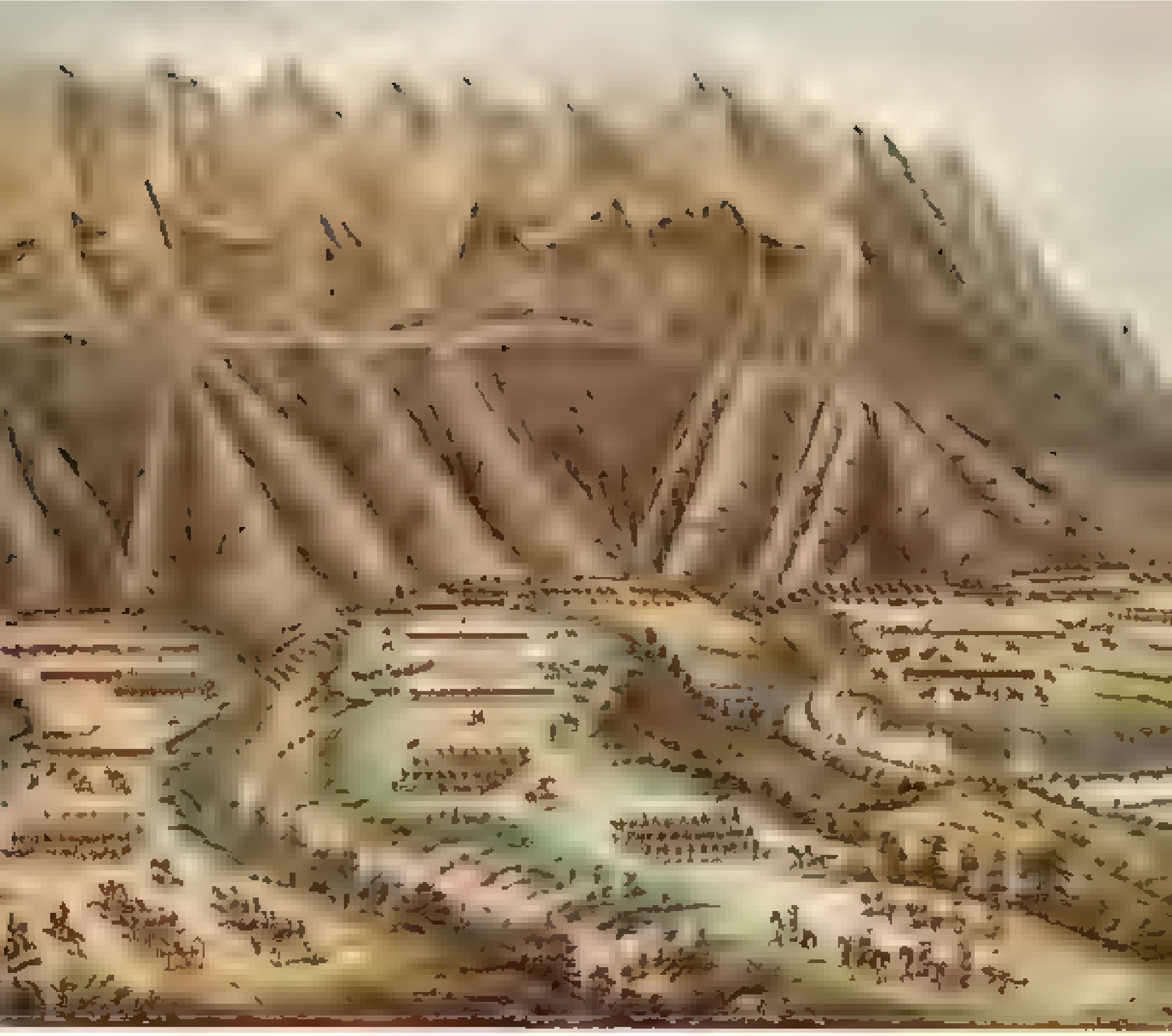
Polk Distrusts Field of Battle

President Polk was distrustful of Taylor's informal habits of command and perhaps of his Whig [illegible] as well. [illegible] "[illegible] partisan without resources and wholly unpolished."

Restricting Taylor to northern Mexico, Polk sent an expedition under Gen. Winfield Scott [illegible] to capture Mexico City. Taylor succeeded through the victory at Buena Vista and opened the way to the city of Mexico and the battle of Monterrey. Polk [illegible] Taylor's victories [illegible] wanted out vea[illegible] [illegible] resources [illegible] These are [illegible] many [illegible] people [illegible] General Taylor never

Battered straw hat he had given [illegible] Taylor has [illegible] "Old Rough and Ready." His [illegible] increased with [illegible] the Mexican War [illegible]

First professional soldier in the White House [illegible] political experience. I [illegible] treatment the Union which Taylor [illegible] "[illegible] have been misconstrued." He



were [illegible] but dressed himself entirely for comfort. He never [illegible] the field in which he was operating [illegible] his own eyes the [illegible] He was very

with both feet on one side—particularly on the battlefield."

Taylor's homespun [illegible] were [illegible] Americans preferred a zealot who were a straw hat [illegible] [illegible] Wright's [illegible] assumed [illegible]

While Taylor's long military record [illegible] appeal to northerners, his experience as a slaveholder [illegible] a hundred slaves would have southern voters [illegible] political background—the fact that he [illegible] never [illegible]

the Democratic candidate, Lewis C[illegible]

Michigan, who favored [illegible] long the residents of territories [illegible] they wished [illegible]

In [illegible] against Taylor [illegible] slaveholder

[illegible] northerners who wanted no extension whatever of slavery formed a Free Soil Party that nominated Martin Van Buren. It was a close election in which the Free Soilers polled enough votes away from Cass, especially in New York, to elect General Taylor.

Role of Hard Supplants Wing Policies

Although Taylor had subscribed [illegible] to Whig principles of legislative leadership [illegible] he was [illegible] not [illegible] to be a puppet of Whig leaders in Congress. To their distress, he acted at times [illegible] like a king [illegible] the [illegible] to [illegible]

Mexicans attack [illegible]

[illegible]

[illegible] Mexicans [illegible] the [illegible]

[illegible] Mexicans [illegible] the [illegible]

[illegible] members of [illegible] Congress were as [illegible] since days [illegible] the President was [illegible] approaching [illegible] making [illegible] gives. In [illegible] Taylor [illegible] several [illegible] the members [illegible] of the slave market operating in the District of Columbia. What was [illegible] territory [illegible] [illegible] fugitive slave law to prevent northerners from [illegible] runaways.

Major Threatens to Hang Secessionists

Three of the great statesmen of the previous generation, Webster, Clay, and Calhoun, [illegible] in the 31st Congress. Many [illegible] were also there eager to make the [illegible] to prevent the fever pitch, threatened to rend the Union. Clay's proposals [illegible] made [illegible] the headway, [illegible] few members of Congress [illegible] accept [illegible], and in part because President Taylor [illegible] first California and New Mexico should be admitted as states.

In February 1850, President Taylor [illegible] leaders who threatened [illegible] if the southerners tried to enforce the law [illegible] would be [illegible] and if they were "taken in rebellion against the Union" he would hang them with less ceremony than he had hanged [illegible] and spies in Mexico. He never waver[illegible]

These events [illegible] unprecedented [illegible] Westward Movement on the [illegible] July 4, 1850, [illegible] President Taylor died. Millard Fillmore [illegible] the [illegible] Taylor's death [illegible] but [illegible] has [illegible] been working to face [illegible] the Federal [illegible] on Rich[illegible] serve [illegible] in the Confederate Army [illegible] under [illegible] named for [illegible] President Zachary Taylor. [illegible] not far from Louisville, Kentucky.

[illegible] of [illegible] has own [illegible] ment, regardless of political complications.

As disheartened as [illegible] was, he carried on a [illegible] that [illegible] purpose [illegible] courage. Taylor [illegible] to run his administration in the same manner [illegible] he had [illegible] hich [illegible] in Texas.

He accepted a [illegible] of [illegible] the [illegible] to overthe new possessions [illegible] the fact that it [illegible] eased to the North rather than the South. He reasoned that the [illegible] would be new [illegible] to be free or slave was to encourage the [illegible] states, [illegible] the [illegible] the question for himself when [illegible] [illegible] Therefore [illegible] settlers in New Mexico and California [illegible] with their [illegible] and seeking forty acres—or [illegible] [illegible]

Sea Captains were furious [illegible] [illegible] and [illegible] for personal savers

Millard Fillmore

THIRTEENTH PRESIDENT 1850-1853

UNDER [illegible] 1850, at a time of acute sectional crisis, Millard Fillmore lent his political skills and the prestige of the Presidency to the enactment of the Compromise of 1850. This attempt to satisfy both slavery and anti-slavery forces temporarily abated the crisis, but brought down upon Fillmore the wrath of some northern Whigs who deplored his moderation. He was the last Whig President.

In his rise from a log cabin to wealth and the White House, Fillmore demonstrated that an enterprising man, through industry and competence, could make the American dream come true. He was born in the Finger Lakes section of New York in 1800, and in his youth endured the privations of frontier life. The log cabin of his birth no longer exists; a reproduction, however, stands in Fillmore Glen State Park, near Moravia.

Young Fillmore worked on his father's farm and at 15 was apprenticed to a wool carder. When he could, he attended a one-room school and in 1818 fell in love with his schoolmistress teacher, Abigail Powers, whom he later married. She tutored him so effectively that he was able to enter school as a student and embarked on his study of law.

Admitted to the bar in 1823, he moved his law practice to Buffalo in 1830. As an associate of the Whig politician, Thurlow Weed, Fillmore served in the House of Representatives. In 1848 while Comptroller of New York, he was elected Vice President.

Fillmore Displaces Chief Executive

In this office, Fillmore presided over the Senate during the months of intense wrangling debate over the Compromise of 1850. Fillmore looked more the part of a President than Taylor, a diarist commented, as the tall, handsome, impeccably groomed, good-natured man labored to maintain an atmosphere of decorum in the Senate Chamber. He made no public comment on the merits of the compromise proposals, but a few days before Taylor's death intimated to the President that if there should be a tie vote on Clay's bill in the Senate, he would vote in favor of it.

Thus the sudden accession of Fillmore to the Presidency brought an abrupt political shift in the administration. Taylor's Cabinet resigned, and President Fillmore at once appointed Webster as Secretary of State, thus proclaiming his alliance with the moderate Whigs, who favored the compromise.

Conciliatory President Sways Congress

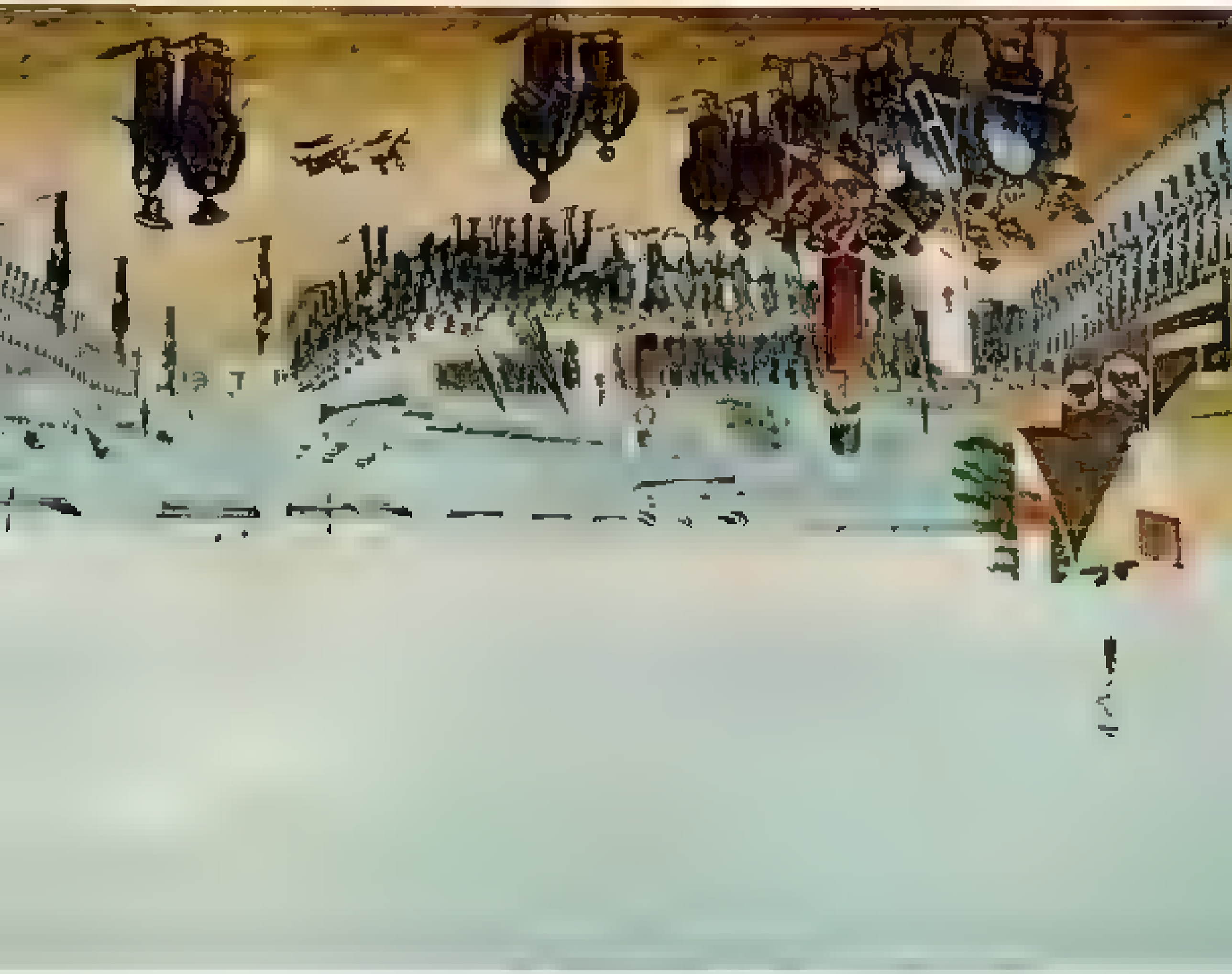
On the last day of July, Clay's compromise bill was defeated except for a provision giving Utah territorial status. A separate bill for California statehood, then in [illegible] by Sen. Stephen A. Douglas of Illinois, brought forth once again all the violent arguments for and against the extension of slavery, without any progress toward settling the major issues. Clay exhausted left Washington to recover, [illegible] throwing leadership upon Douglas.

At this critical juncture President Fillmore showed the full weight of his administrative and party leadership in favor of a compromise. On August 6, 1850, he sent a message to Congress recommending that Texas be paid a substantial sum to abandon her claims to part of New Mexico. Significantly he asserted near the end of the message:

> I think no event would be hailed with more gratification by the people of the United States than the amicable adjustment of questions of delicacy which have now for a long time agitated the country and which, [illegible] the exclusion of other subjects, the time and attention of Congress.[illegible]

Fillmore's message coming at a time when public opinion throughout the Nation was increasingly favorable to a compromise, helped influence a critical number of northern Whigs in Congress away from their adamant insistence

[illegible] squat, [illegible] January [illegible], [illegible] the contrast [illegible] as well [illegible] Fillmore [illegible] Warren [illegible] here as leaders. New Yorker [illegible] opposed the Compromise of 1850. The Fugitive Slave Act, one provision of the Compromise, so outraged the North that it caused [illegible] Fillmore's Presidency [illegible] the end of the Whig Party.



Franklin Pierce

FOURTEENTH PRESIDENT

F

Tobacco because the Democrats spoke more firmly for the Compromise than the Whigs, and because the Whig candidate Gen. Winfield Scott was suspect in the South, Pierce won in a landslide by a margin of popular votes. Thus this handsome, well-mannered but inactive and inexperienced man found himself President at a time when the challenge of the office far exceeded his modest abilities.

Tragedy Clouds Pierce Inauguration

Two months before he took office a railroad train in which he and his wife were riding was wrecked, and their only remaining child, out of three, an 11-year-old boy, was killed before his eyes. He entered the President's chamber shaken and nervously exhausted.

In his Inaugural, Pierce proclaimed an era of peace and prosperity at home and vigorous relations with other nations. The United States might have to acquire additional possessions for the sake of its own security, he pointed out, and would not be deterred by "idle and groundless forebodings of evil."

Pierce had only to make gestures toward expansion to excite the wrath of northerners, who accused him of acting as a cat's-paw of slaveholders eager for areas into which to extend slavery. Thus there was a recession when he pressured Great Britain into yielding to US special interests along part of the coast of Central America, and even more when he tried to persuade Spain to sell Cuba.

Pierce was successful only in friendlier directions. He continued efforts to open Japan. President Fillmore had sent Commodore Matthew C. Perry, who, using wit, skill and firmness, had delivered a message in 1853 returning to Japan the next year. Perry brought back to Pierce a treaty opening two relatively inaccessible ports.

Pierce was also successful in negotiating a reciprocity treaty with Great Britain in 1854. It won fishermen access to Canadian shores for American fishermen in return for opening the United States to more Canadian products.

At home, almost every measure Pierce favored worked out badly in considerable part because the conflict between the North and South increased. Instead of mediating matters favoring the South at nearly every point, Pierce signed a lower tariff measure and vetoed an internal improvements bill. Southern votes in Congress broke a homestead bill, which would have benefited Northerners.

But the most vehement renewal of the storm stemmed from the Kansas-Nebraska Act, which repealed the Missouri Compromise and reopened the question of slavery in the West. This measure, the last work of Senator Stephen A. Douglas, grew up partly out of his desire to promote a railroad from Chicago to California through Nebraska. Already Secretary of War Jefferson Davis, a proponent of a southern transcontinental route, had persuaded Pierce to send James Gadsden to Mexico to purchase lands along the Gila River there, on which a southern railroad might best run. Gadsden, for $10,000,000, purchased the area now comprising southern Arizona and part of southern New Mexico.

"Bleeding Kansas" a Prelude to War

Douglas's proposal to organize western territories through which a railroad might run, caused yet more trouble. A proponent of "popular sovereignty," Douglas proposed in his bill that the residents of the new territories could decide the slavery question for themselves. The result was a rush into Kansas as southerners and northerners vied to obtain a majority of the territorial government. The South sent in more settlers, but Pierce tended to throw his influence toward the South. Shooting broke out, and "bleeding Kansas" became a prelude to the Civil War.

By the end of his administration, Pierce could claim "a peculiar condition of things in Kansas." But to his disappointment, the Democratic Party in 1856 refused to renominate him, turning to the pro-Buchanan Pierce returned to New Hampshire, leaving his successor to face the storm fury of the sectional whirlwind. Obscure in retirement even at home, Pierce died in 1869.

Fort Sullivan in Concord now maintained as a museum by the New Hampshire Historical Society, displays relics of the Pierce family.

Lifelong friends, Pierce and writer Nathaniel Hawthorne stroll at left in the Arch of Titus in the ruins of the Roman Forum. Meeting in Rome shortly after the President had left office, Hawthorne noted "marks of a withering hand" and a "something he seemed to have passed away out of his world of sympathies." Hawthorne, who attended Bowdoin College with Pierce, delivered a tribute toward the President's eulogy writing his biography.

James Buchanan

FIFTEENTH PRESIDENT, 1857-1861

JAMES BUCHANAN prestige lower a free-
[illegible]
cession after concession to the South regard-
less of the anger he provoked in the North.
When the actual breakup of the Union began

Long Apprenticeship Led to Presidency

Born in 1791 in Franklin County, Pennsylvania, Buchanan descended from Dr. Benson Buchanan. His child hood home, moved from its original site, now stands—after careers as museum and antique shop—on the campus of Mercersburg Academy.

Learned in law and a great debater, Buchanan rose rapidly in politics. Disappointment marred his early life. Jilted by a fiancée, he never married.

[illegible] views earn him a career. Buchanan served in the 13th Congress and his subsequent terms in the House of Representatives. He served as Minister to Russia, then as a decade in the Senate. He became James Polk's Secretary of State and Pierce's Minister to Great Britain. His service as a diplomat in the London embassy protected him from the bitterness of the controversies at home.

Nevertheless, Buchanan seemed to have been a successful President. By the latter 1850s we have had abundantly as I have—and through experience, but because he grasped and [illegible] the political realities of the time. He [illegible], stalls forever in the high stock he wore at [illegible] his cloak, he [illegible] offered [illegible] to [illegible] doctrines. [illegible] Buchanan [illegible] that the North would [illegible] constitutional [illegible] which [illegible]

vered the South. Nor could he realize how so [illegible] and regional political parties.

This sectional cleavage, destroying the Whigs, had brought the rise of the Republicans. The Republican Party, formed in 1854 in protest against the Kansas-Nebraska Act, coalesced northerners and westerners united with [illegible] of the national [illegible]—[illegible] seeking a protective tariff, [illegible] because [illegible] blocked a homestead bill, westerners wanting subsidies for internal improvements. A [illegible] commitment to halt the extension of slavery also united these diverse groups.

To moderate southerners, the Republicans seemed an [illegible] menace. The Democratic party ran John C. Fremont for President against Buchanan and might have defeated Buchanan by polling a few additional votes in Pennsylvania and Illinois.

At the time of his inauguration, Buchanan thought that the crisis would disappear if he maintained a sectional balance in his appointments and could persuade the people to accept a constitutional law as the [illegible] Court interpreted it. The Court was then composed of the big days of restricted suffrage, of the territories, and two justices hoped to learn what the [illegible] would be.

Supreme Court Decision Enrages North

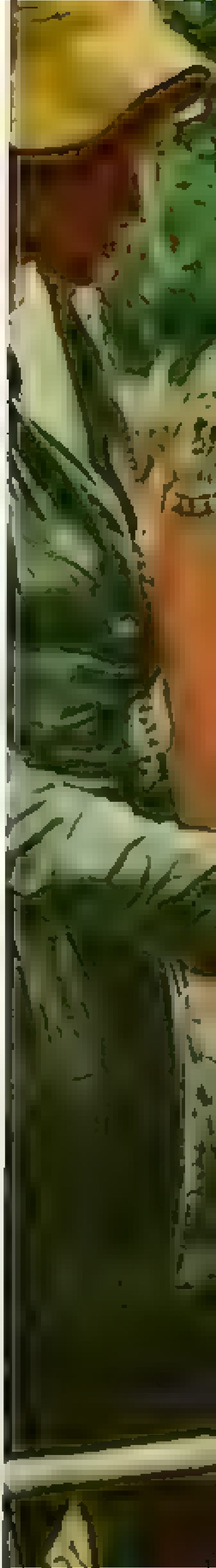
[illegible] in his Inaugural [illegible] President [illegible] to the territories, as [illegible] a matter of but [illegible] importance" since the Supreme Court was about to settle it "speedily and finally."

Two days later Chief Justice Roger B. Taney delivered the notorious Dred Scott decision, asserting that Congress had no constitutional power to deny persons of Negro descent, free or slaves, in the territories. Northerners were enraged, of course, but the decision revealed a divide in the North. Republicans complain [illegible] themselves to extremism.

Celebrated [illegible] James Buchanan [illegible] between Lewis Wade House parlors and [illegible] West Washington [illegible] Pennsylvania Avenue.

The Making of an Astronaut

By ROBERT R. GILRUTH



possible accidents and how to avoid them.

Such exciting preparations have made Americans more than ever the world's most active [illegible]. Even sleek white-bellied [illegible] air cruisers, they race the sun from coast to [illegible], squeezing extra hours out of the days, their streaking white contrails [illegible] pattern across the heavens from Florida to [illegible], Long Island to Oregon, St. Louis to the Nation's Capital.

And from [illegible] home.

Here is the National Aeronautics and Space Administration's Manned Spacecraft Center near Houston, Texas, 1,620 acres of laboratories, test chambers, and offices. Across [illegible] as geometrical [illegible] the greatest feature [illegible] our [illegible] and [illegible] a trip to the moon.

To understand the [illegible] of these events, look at the recent history of space. Less than two years ago I stood in the Mercury Control Center as Maj. L. Gordon Cooper, Jr., began his last orbit [illegible] completing this Nation's longest space flight—34 [illegible] hours. Now the [illegible] Gemini [illegible] two-man crew [illegible] [illegible] orbiting [illegible].

Rendezvous in Space Comes First

Gemini flights are an intermediate step in our moon-flight program. They will permit us to study the effects of weightlessness for up to two weeks and teach us the techniques required to bring two vehicles together in space. We must master space rendezvous if we are to reach for the moon later. In the Gemini program, managed by Charles W. Mathews, astronauts will practice this complex maneuver with the unmanned Agena vehicle, set aloft atop an Atlas missile.

Before the end of this decade, the 36-story Apollo-Saturn V vehicle will carry men to the moon. Apollo consists of two spacecraft: the [illegible]-pound Command and Service Modules, in which three men will travel to and from the moon; and the 29,000-pound Lunar Excursion Module (LEM), in which two of the crew will land on the lunar surface while the third orbits the moon in the Command Module, awaiting their return.

Blinking signal from the [illegible] mirror of a stranded astronaut attracts the attention of a [illegible] helicopter [illegible] over the desert, another survival training ground near [illegible] [illegible].

Scanning signals [illegible] at [illegible] Kitt Peak National Observatory [illegible] Arizona. Astronauts [illegible] [illegible] world's largest [illegible] telescope, to study lunar craters. Here [illegible] [illegible] into the telescope [illegible] [illegible] the sun's image. For [illegible] [illegible] dark glasses.

If the Mercury vehicle is the Wright *Flyer* of the Space Age, certainly the Apollo ranks as the jet transport of space flight. Moreover, space progress is accelerating. More than half a century passed between the Wright *Flyer* and commercial jets. Less than a decade will separate [illegible] Mercury from the lunar touchdown of Apollo. And who knows what lies beyond?

As Director of the NASA Manned Spacecraft Center, I have watched the growth of our Nation's space technology. I remember the makeshift quarters in which a few of us gathered in 1958 to begin Project Mercury. Today, from my ninth-story window [illegible] Project Management Building, I look out on some of the world's finest specialized facilities for manned space flight, now rapidly approaching completion (page 13[illegible]).

For example, the nine-story [illegible] building contains a 120-foot-high chamber in which a full-size spacecraft and its crew will experience a simulation of [illegible] environment. Chamber walls lined with liquid-nitrogen expose Apollo's skin to the -280° F. of the nighttime lunar surface. Through portholes in the side and above, racks of carbon-arc searchlights bake the craft at 260° F., the daytime maximum (page 135).

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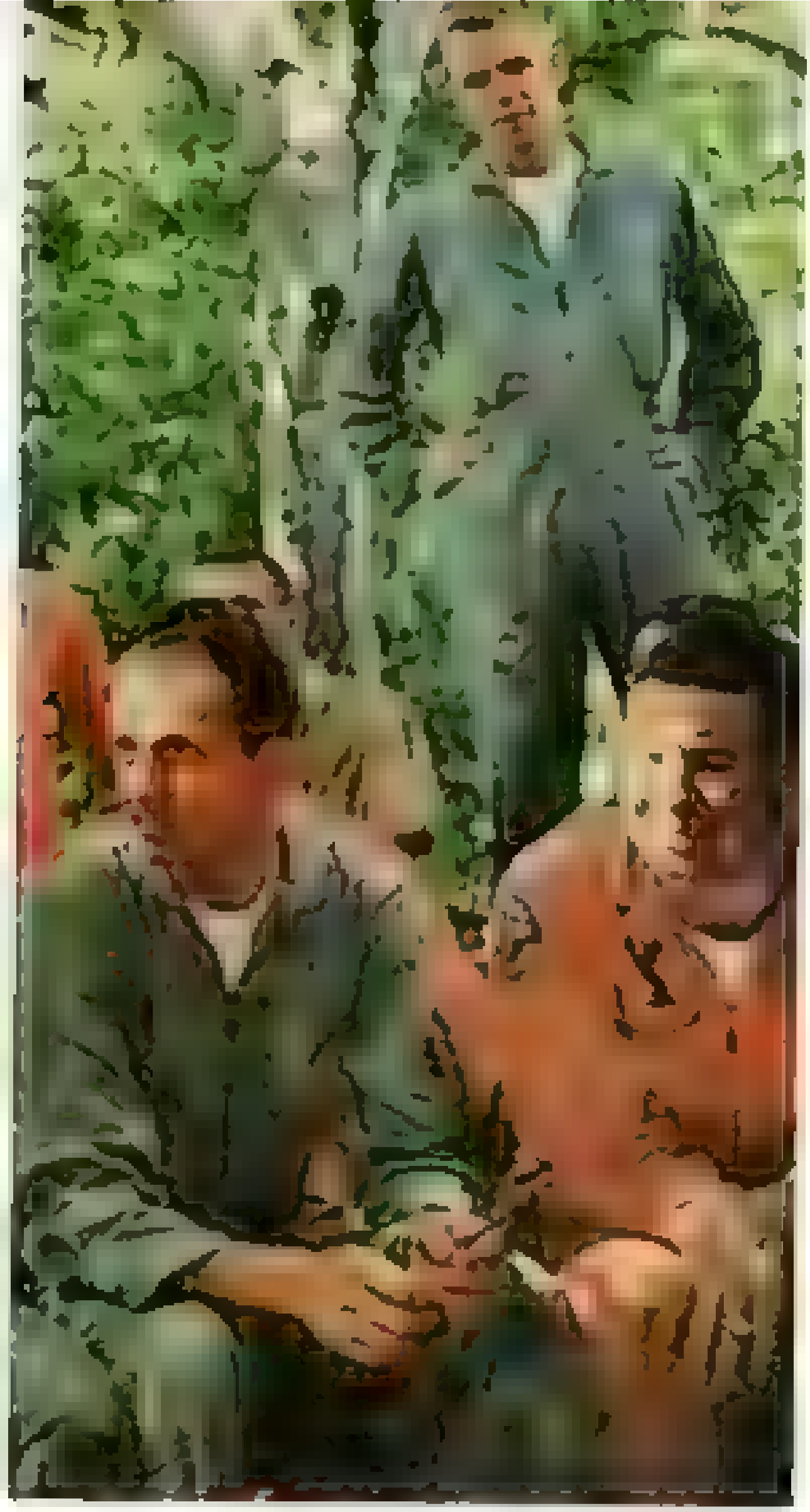
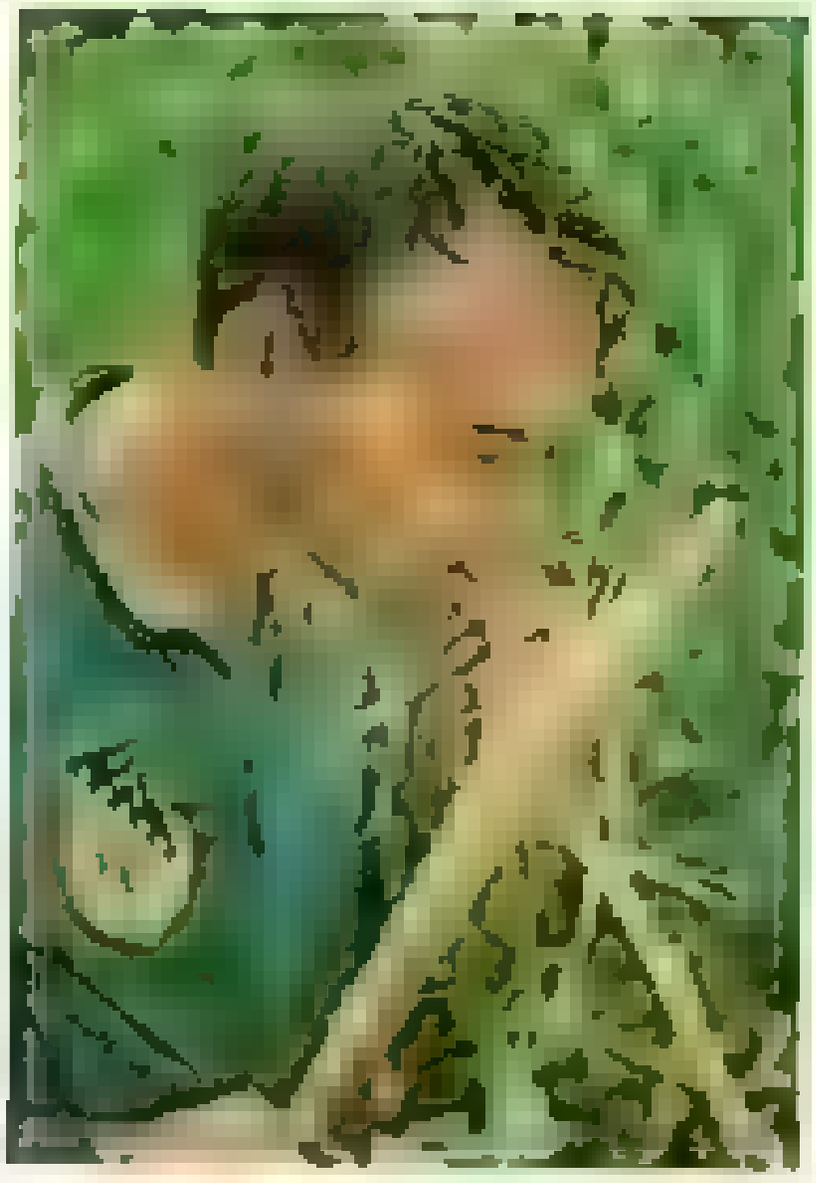
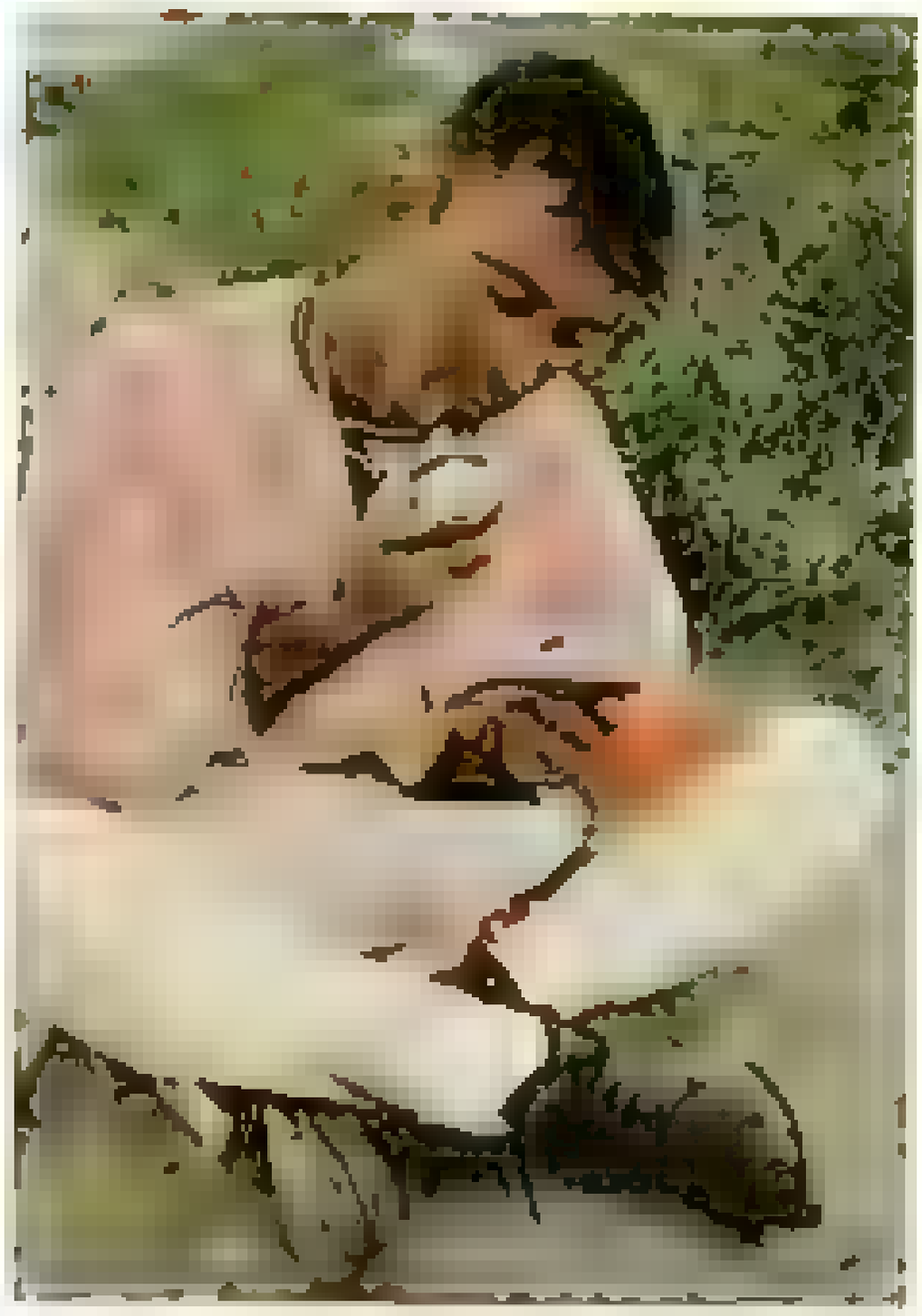
*See "Footprints on the Moon," by [illegible] Dryden, [illegible]

Examining rock strata







[illegible] most experienced engineers and scientists employed by nearly [illegible] technicians, administrators [illegible] workers likely to make the development of spacecraft, our people whose investigations, research projects, [illegible] spend part of their time in the classroom both teaching and being taught [illegible]

[illegible] Take [illegible] 50 hours a week for [illegible] to five years training for a single flight. [illegible] such a crew will be tested [illegible] for a week or longer more than the entire training program for all the astronauts.

We provide only postgraduate training for our astronauts. Their preparation begins long years ago in school, where most [illegible] data, power, aeronautics or science degrees. Then come flight training, [illegible] as many as ten years in jet pilots. Many have had a graduate course in test pilot school.

[illegible] pilots. They have excellent health, [illegible] and stability and coolness under pressure. They have operated aircraft under the most dangerous conditions. Some have flown in combat. They have faced fear and [illegible]

Our [illegible] men, in forming [illegible] seven man Mercury team, nine "intermediate" class members [illegible] for the two-man Gemini flights, and [illegible] "freshmen" just completing their first full year of space training. Later this year we will select a dozen or so additional astronauts [illegible] basis on their scientific background and [illegible]

Studies Include Comets and Computers

Our Astronaut Training Program covers [illegible]

The Spacecraft. Each man must become [illegible] familiar with all the spacecraft systems. How they are built, how they [illegible]

Our Space Environment. He must learn to feel at home in the weightlessness of space, the weak lunar gravity, only one-sixth that of earth, the rolling temperature extremes, and the [illegible] stresses of launch and re-entry.

Work Survival. Each must learn how to eject himself from his spacecraft, how to survive [illegible] in the water, desert or jungle, and how to [illegible]

Space Science. Each must become [illegible] observer with a knowledge of [illegible] astronomy, so he can be trained to see, state information [illegible]

In [illegible] comets, about everything from comets and [illegible] connections to computers [illegible] communication.

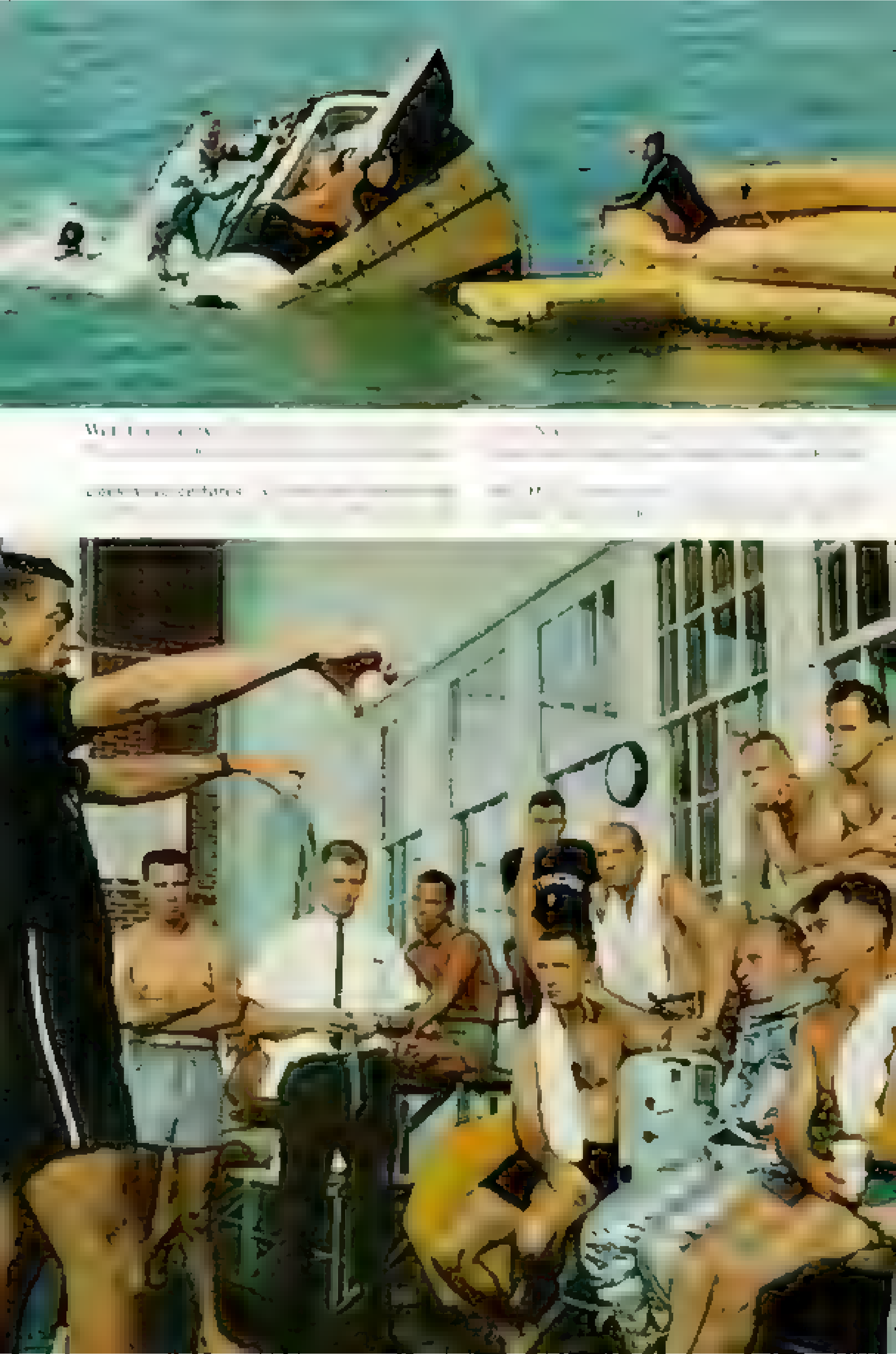
But [illegible] more than hours and [illegible] times. Spacecraft change, new systems are added and systems modified. As [illegible] the problem that [illegible] altered an old Swedish friend who said: "I have hands created to sail ships, and always they are [illegible] proved."

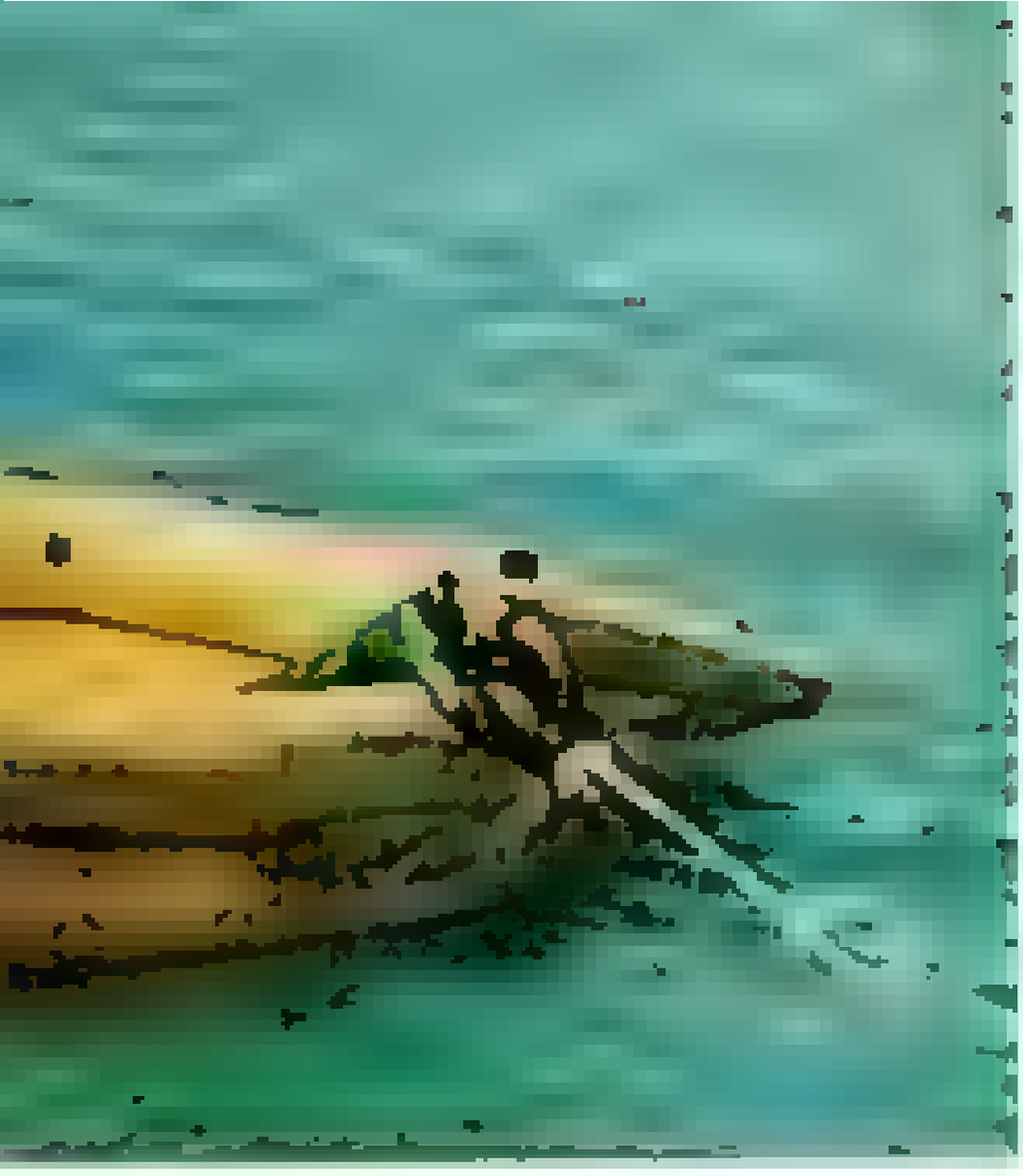
The complexity of the program is such that one of the best ways to keep up to date is to work right with the engineers who design the spacecraft. This is one of the advantages of having the astronauts [illegible] at our center side by side with the skilled scientists who manage our spacecraft programs. By [illegible] meetings the astronauts [illegible] of months [illegible] such as [illegible]

One man cannot hope to attend all conferences [illegible] parts [illegible] and keep the [illegible] abreast of new developments.

As spacecraft systems become more complex, we [illegible] more [illegible] training [illegible] for [illegible]

Lake front [illegible] from May [illegible] Alan B. Shepard Jr. [illegible] Charles A. Bassett II and [illegible] Freeman [illegible] reference 20 seconds of weightlessness in KC-135 jet tanker over Wright Patterson Air Force Base [illegible] Shepard flies the rest of a mission [illegible] the space environment almost [illegible] with [illegible] Instructor Pilot [illegible] Kawano [illegible] of astronaut. Astronaut [illegible] Bassett and Freeman [illegible] crash [illegible]





[illegible] as the instructor [illegible] the trainee through its paces.

"4, 3, 2, 1, 0 [illegible]."

With a simulated roar of Titan II rocket engines, your imaginary flight begins.

[illegible] a great clock is [illegible], and now the diameter needle comes off the peg as the Titan rumbles its way skyward.

Then seconds after lift-off, the black and white eight-ball attitude instrument rises sightly to the left and then downward as the rocket arcs over and heads down range from Cape Kennedy.

"Two minutes, thirty seconds. Standby for SECO."

Very soon the flashes on the locating booster engine cut. In a moment, a green light and a voice confirm that the Titan's second stage engine has come to life.

"Five minutes, thirty seconds. [illegible] looks green. Standby for SECO."

The read-out display of the mission timer usually count the seconds to the point of stage-and-engine cut. Now the engine [illegible] passes away to silence, and you are in orbit, [illegible] the earth at a speed of some 17,500 miles per hour.

I remember the [illegible] you asked which part of the [illegible] was the most difficult. "I guess the part between lift-off and [illegible]," was reply.

LEM Pilot Must Land Carefully

Though the command module seems crowded, the Apollo simulator was larger yet. Stanley Sheff, chief of Bell's simulation, takes to the visitors. "If we had everything, including—[illegible] a bathroom and a kitchen sink."

More than twice as large as the command module, the Apollo development will actually [illegible] two units: the simulators of the Command Module and the LEM.

Among the more impressive features, an out-the-window display gives the new [illegible] panorama, make-believe journey through [illegible] miles of space. Nine units of optical equipment produce this celestial [illegible]

because their critical star navigation [illegible] must [illegible].

Though the Apollo simulators are not yet operational, we can get a good feel for what the moon landing in the LEM will be like [illegible] and Control Division. Stepping through a doorway, one enters a cabin [illegible] what looks like the bridge of a ship. Instead of a ship's wheel, we find switches that can begin a make-believe landing.

Three such triangular windows on the left shares a rightangle surface—red and yellow crosses and arrows grouped in squares like a patchwork quilt. This particular device cannot simulate the values and points of the moon as the actual LEM simulator will do, so it creates a completely abstract surface to fly over.

Docking Trainer Bides Cushion of Air

Test pilot James Bruce describes the landing problem: "The autopilot starts you carrying toward the lunar surface. You fine over at 200 feet, as the LEM rushes downward. Your job is to slow it with your descent engine and search for a soft landing in a safe place—and you have only two minutes to do it. After that your landing fuel burns out. With no power, and with [illegible] surface due to [illegible] you, [illegible] and [illegible] smash into the moon's surface."

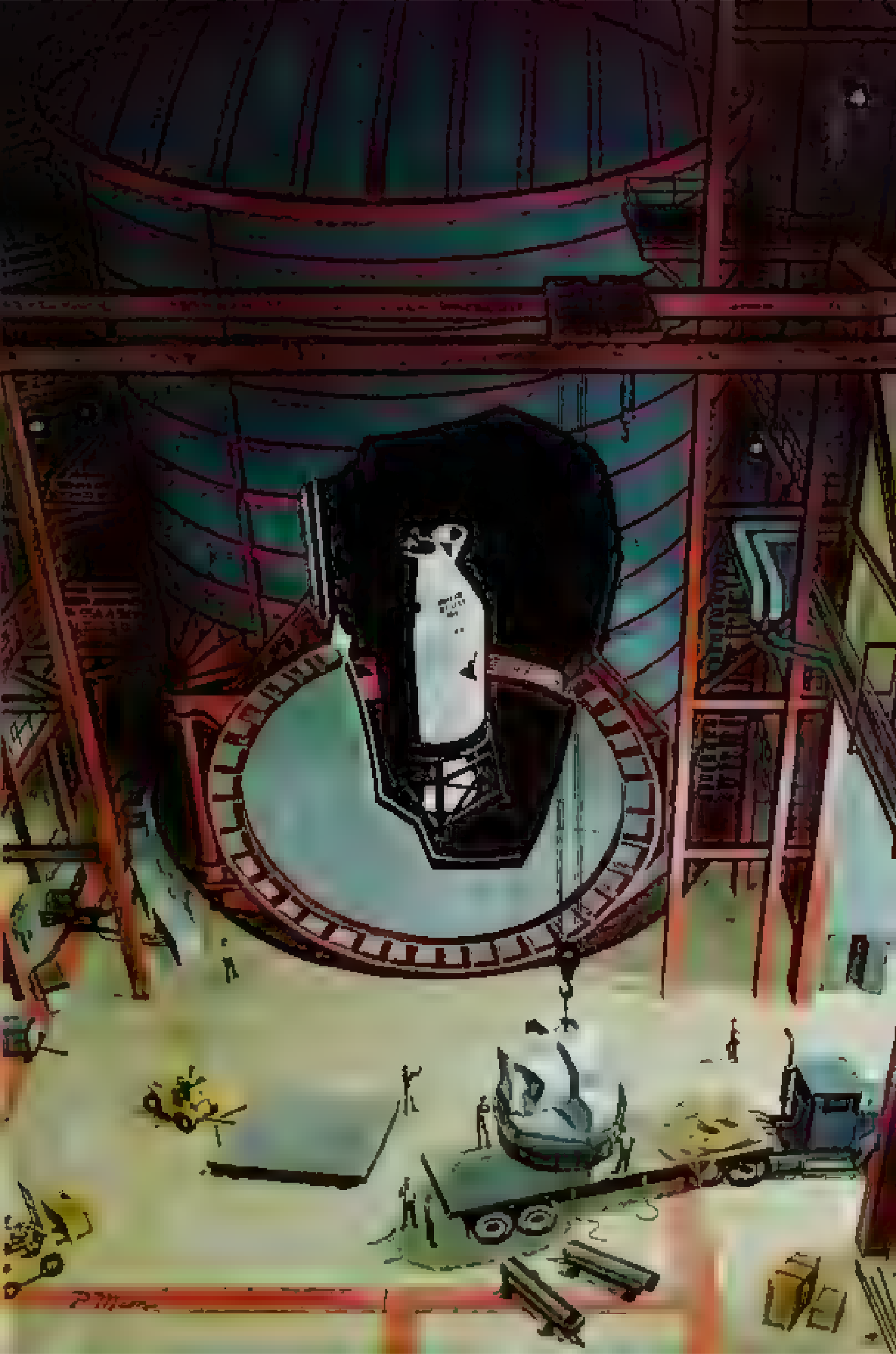
But these stationary simulators have one thing in common. If you make a mistake, you can [illegible] smash into anything. You merely press the button marked "Reset" and start over.

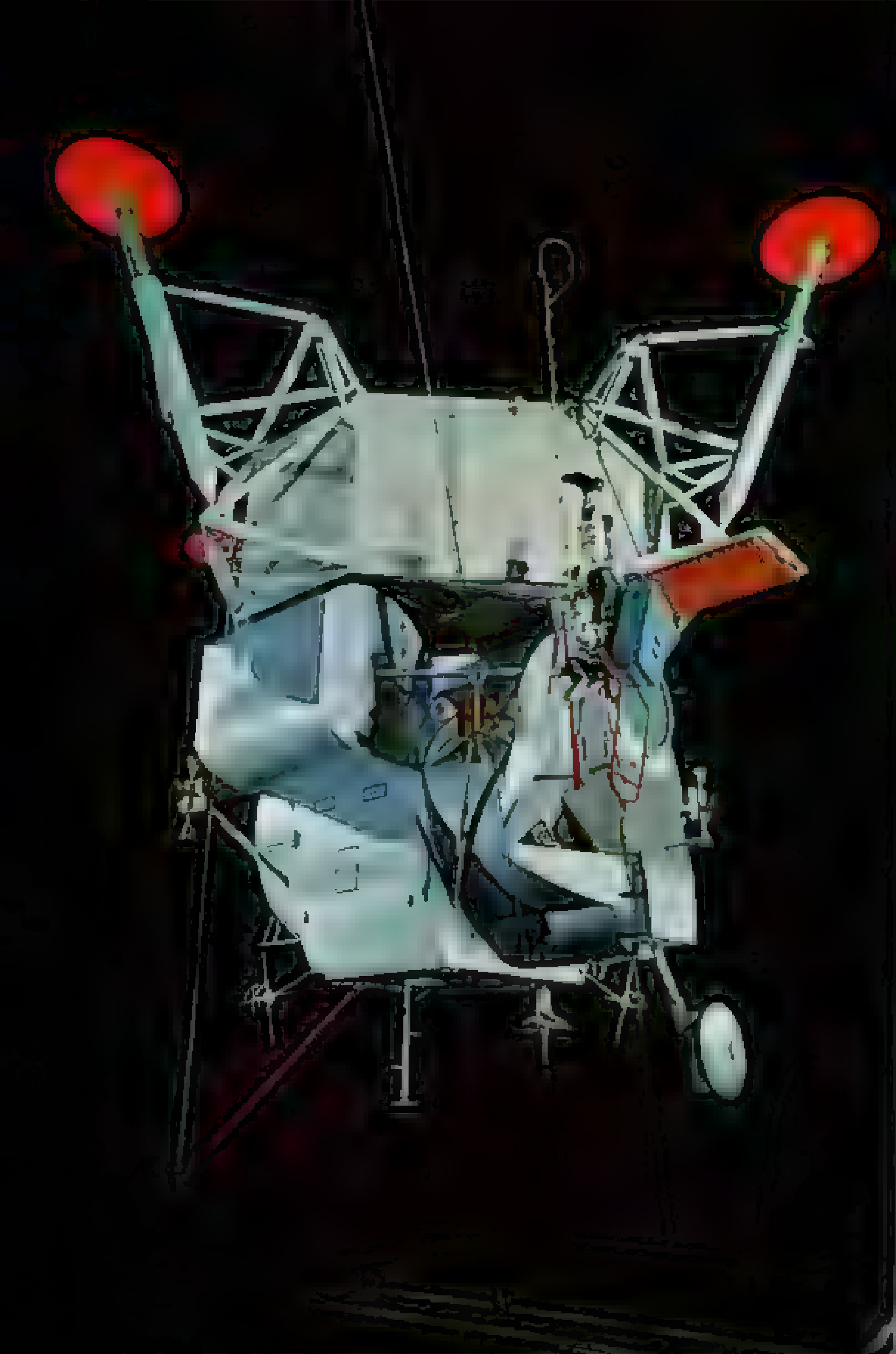
For [illegible] docking tasks, we use simulators that move like the spacecraft themselves. In one of these "moving base" trainers, the transmission and [illegible] simulator is here [illegible] center. It [illegible] a [illegible] size [illegible] painted black inside to suggest the darkness of space.

Now, with Charles Walter M[illegible] Jr. at the controls, [illegible] nods, turns, and rolls from [illegible] cabin. Walter peers [illegible] at the [illegible] Agena, suspended at the far end of the darkened chamber and half lit by a shower of artificial sunlight.

[illegible] Moon Jet Never [illegible]

Now [illegible] action at the Manned Spacecraft Center near Houston, Texas. The [illegible] 20 feet [illegible]. In this artist's view, cutaway of the [illegible] moon. A [illegible] will orbit the moon. With [illegible] one of the [illegible] crew [illegible] Control [illegible] will see within the [illegible] of those of [illegible] mission. The spacecraft [illegible] on the dark side, while one [illegible] takes [illegible] the Command Module to take on two passengers for [illegible]





Starting out slowly, [illegible] Wayne Jones has been [illegible] propulsion handle. A low hiss issues from the simulator [illegible]. But not for long, the Gemini [illegible] and flight the Agena [illegible]. With gathering momentum, Agena tracks silently toward the Gemini [illegible] on controlled sprays of gas.

"Don't [illegible] too much," Wayne [illegible] at a [illegible] stuck on the control handle [illegible] the more [illegible] the large silver tube with the [illegible] exhaust [illegible]. There is a slight bump as the vehicles come together.

[illegible] remarks are [illegible] remarks as he prepares the [illegible] phase of Gemini and the basketball-like jumper rise on the Agena.

"Sandy Longlegs" Teaches Lunar Landings

After mastering the [illegible] base [illegible] takes the [illegible] and dons the [illegible].

[illegible] Research Center [illegible] Edwards Air Force Base, California, the astronauts perform [illegible] the LLRV—Lunar Landing Research Vehicle. This [illegible] nicknamed "Sandy Longlegs" performs [illegible] the LEM will on the moon.

[illegible] most [illegible] of [illegible] points [illegible] Wayne [illegible] the [illegible] craft [illegible] feet. There [illegible] rises a switch that [illegible] back [illegible] compensate for [illegible] five-sixths the weight of the vehicle. The remaining weight makes it possible for just the [illegible] of the moon's lower gravity.

From this point down, the pilot takes over [illegible] the LEM.

[illegible] on the desert [illegible] as close as [illegible] to the real thing. A mistake could mean ejecting [illegible] of [illegible] desert floor.

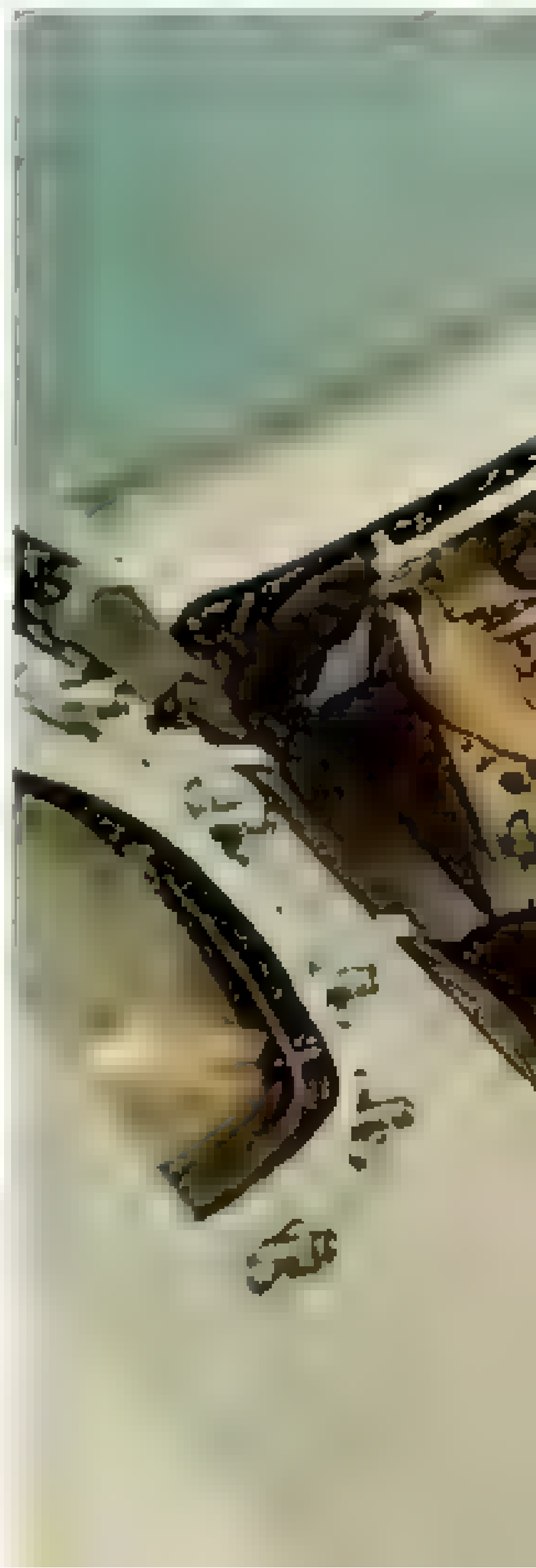
With the many [illegible] NASA [illegible] hours [illegible] of actual [illegible] flying [illegible] month, Lt. Colonel Charles Conrad, Jr., [illegible] up [illegible] "It's easy to sit back [illegible] a training device and know that if you [illegible] wrong the instructor will [illegible] the reset [illegible] can try again. But in an airplane [illegible] the astronaut must know more than how to fly a [illegible] craft. He must also [illegible] hostile environment.

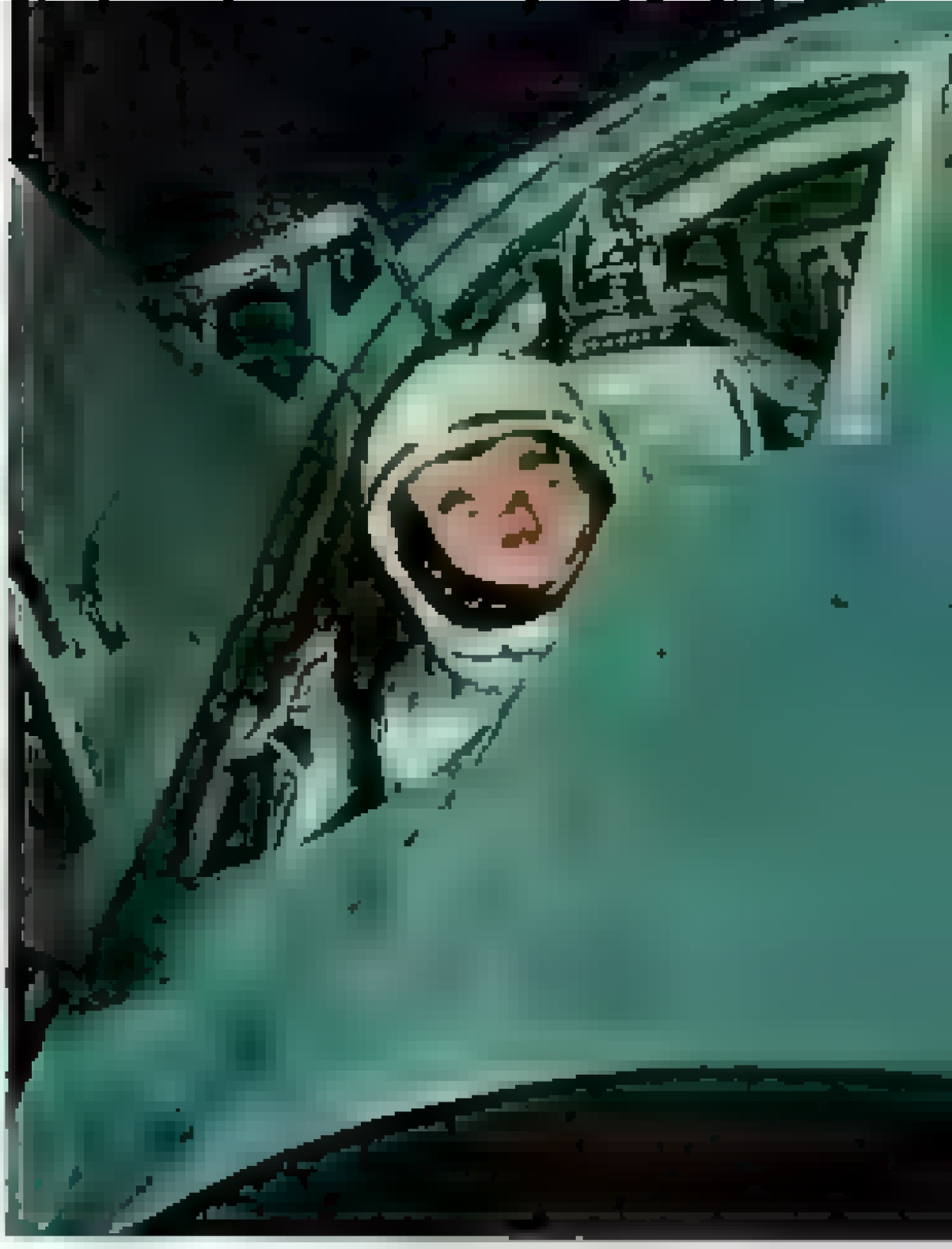
The Bell Training [illegible] or Balanced Extravehicular [illegible] A [illegible] astronauts have to [illegible] in [illegible] space. This [illegible] have a steel [illegible] of compressed air. A [illegible] tank between [illegible] and [illegible] from each [illegible] sets. The astronaut must [illegible] the [illegible] Aft from a [illegible] pack [illegible] the [illegible] Apollo [illegible] on a flight [illegible].

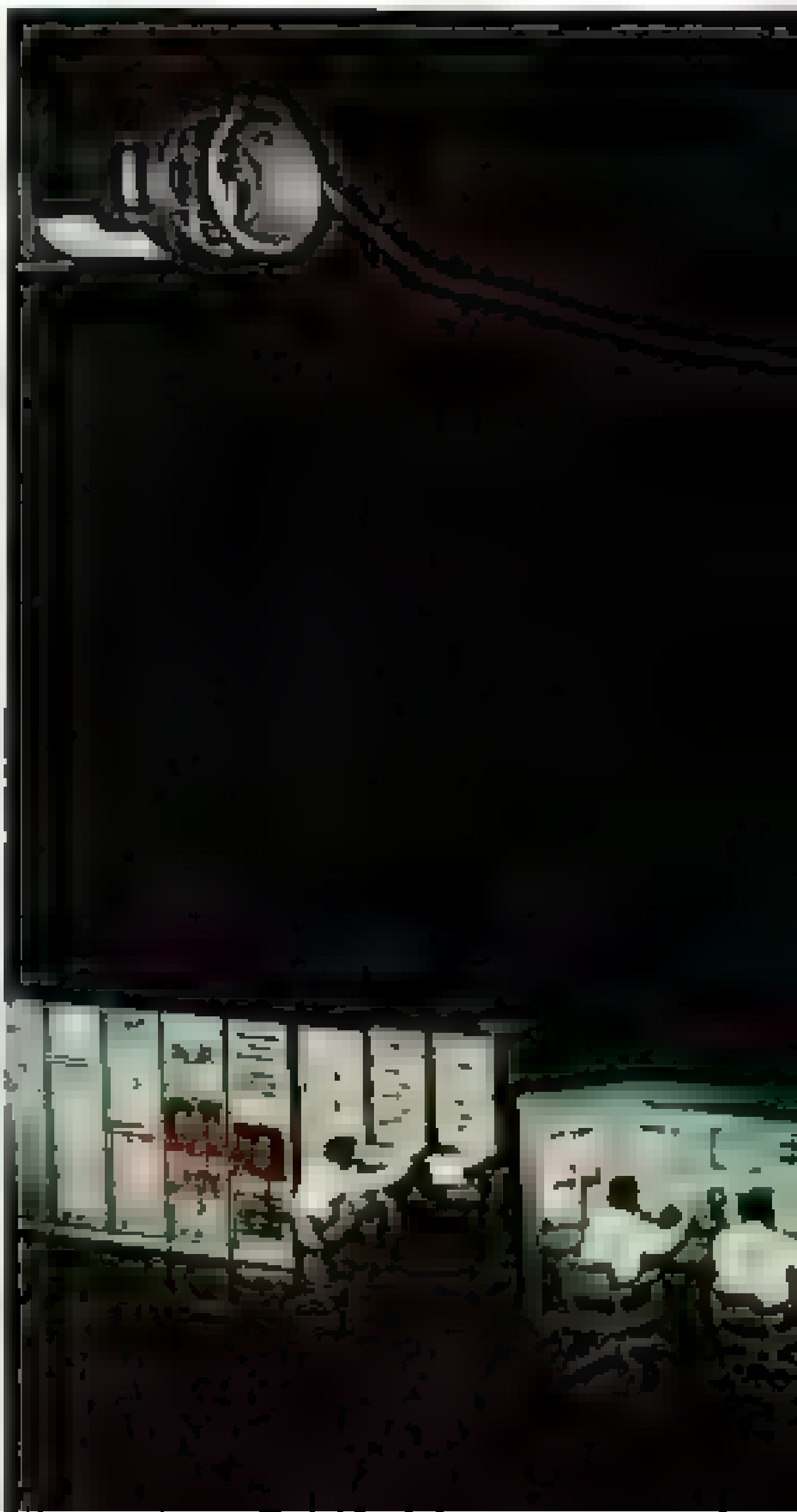
A Forward Fuse [illegible] the [illegible]

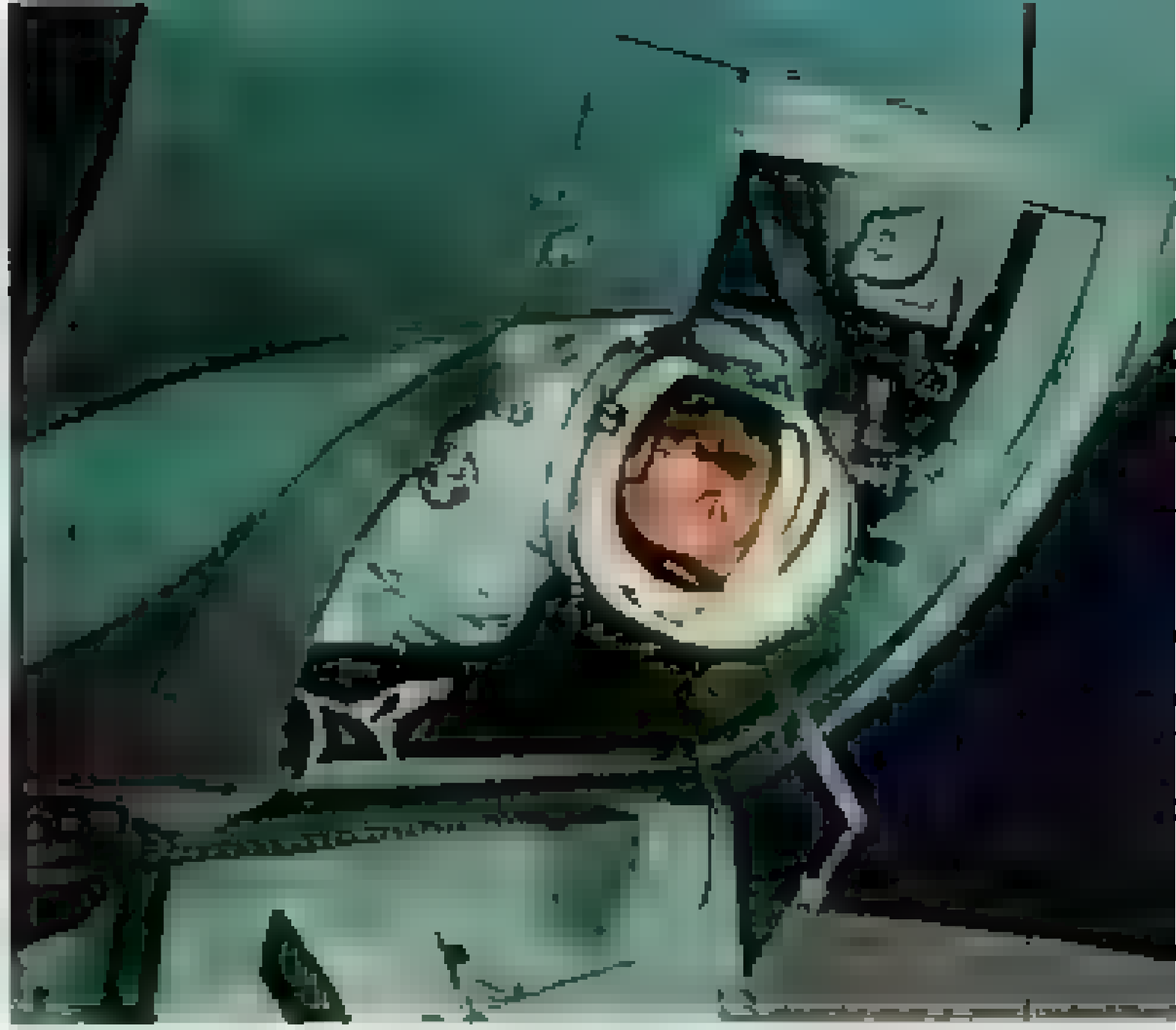
Project's [illegible] Jones [illegible] Mercury [illegible] Nine-story [illegible] project. Management [illegible] control [illegible] above the [illegible]

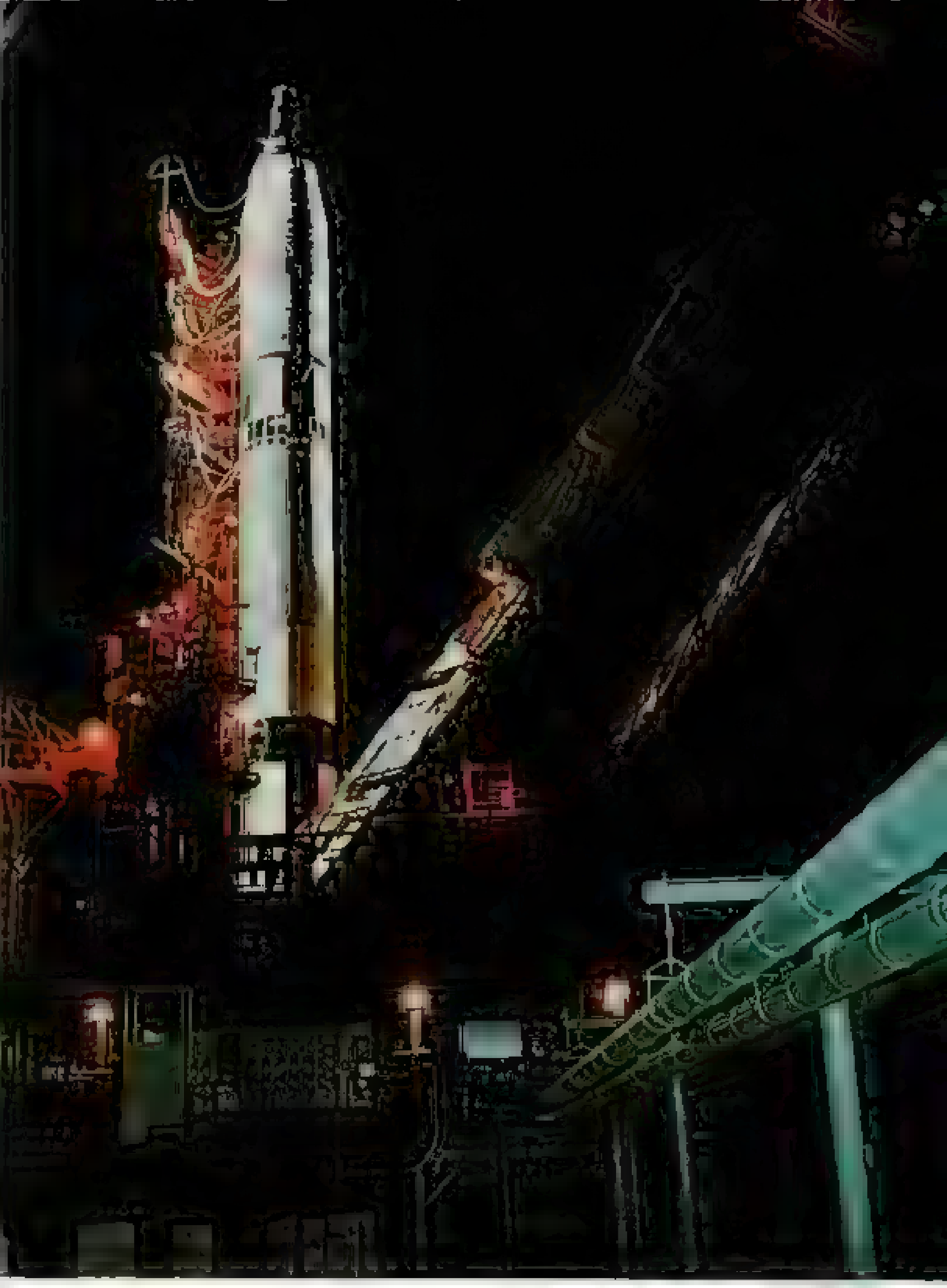
Gemini astronaut [illegible] the [illegible] and [illegible] at [illegible] Astronaut Major Gordon Cooper [illegible] Navy [illegible] Support Division [illegible] that would lose [illegible] Jones [illegible] of [illegible]











[illegible]

still we like every step to be ready."

[illegible] tows the [illegible] easier than using a plane. Starting a few [illegible] canons before standing the [illegible] The astronaut launches himself with a few running steps, [illegible] down to a wet but safe landing.

Getting wet is both no new to astronauts, however. "I did I wear the same sort of [illegible] and landing gear to our [illegible] the best way of [illegible] and I'd [illegible] water surface offer a very handy shock absorber."

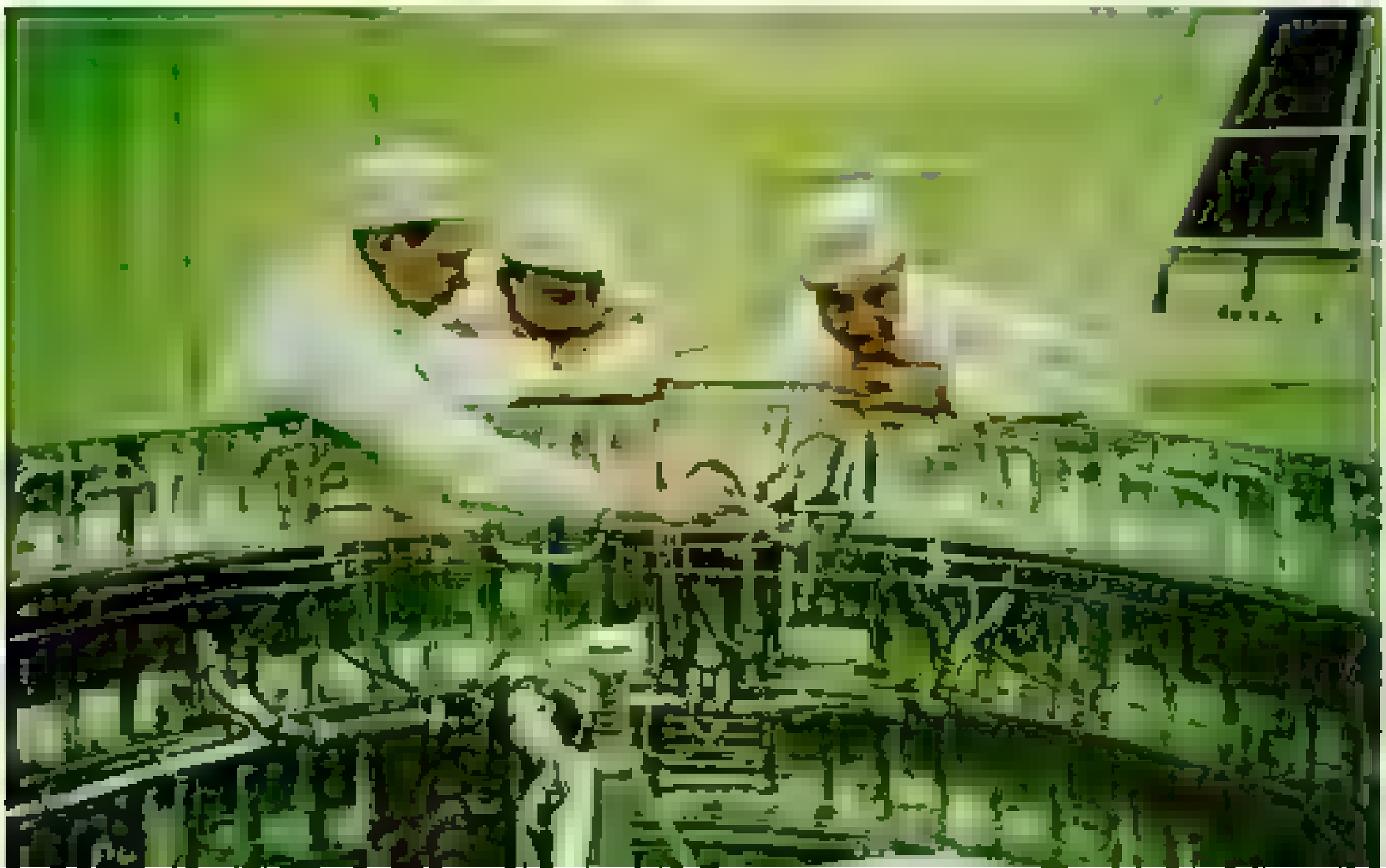
At the Naval Air Station in Pensacola, Fla., the Leach crew member learns to swim while encumbered [illegible] pressure suit. The Navy swimming pool [illegible] learn how to [illegible] from parachute harness lines, how to use his [illegible] and how to get out [illegible]

spacecraft begins in the water test basin at Langley Air Force Base, Va., or at Houston [illegible] what we call a "bodysponge" [illegible] [illegible] the astronaut body [illegible] [illegible] over special pressures below in the open water of nearby Chesapeake Bay (page 162).

[illegible] Desert [illegible] of the desert, the astronauts travel to Nevada [illegible] in the rugged mountains of western Nevada [illegible]

Before they are turned loose [illegible] in the wilderness [illegible] to make emergency [illegible] shock-style boondocks and [illegible] values of orange and white [illegible]

Despite dire tales of sidewinders [illegible] monsters, we're [illegible] [illegible] ankle by a scorpion [illegible] has own [illegible] refuse [illegible] after all, he reasoned [illegible]



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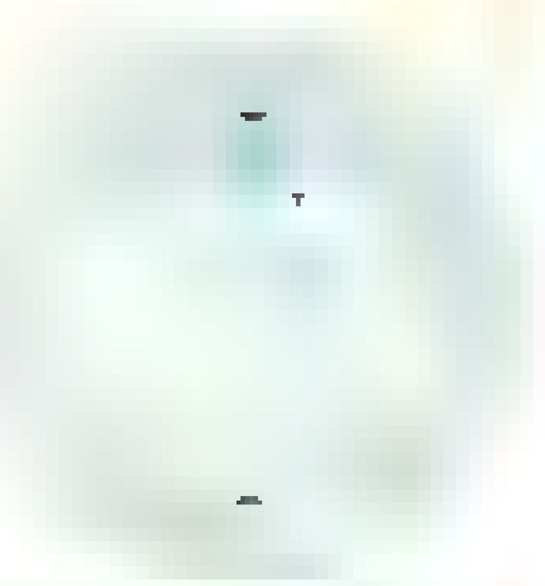

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COVER

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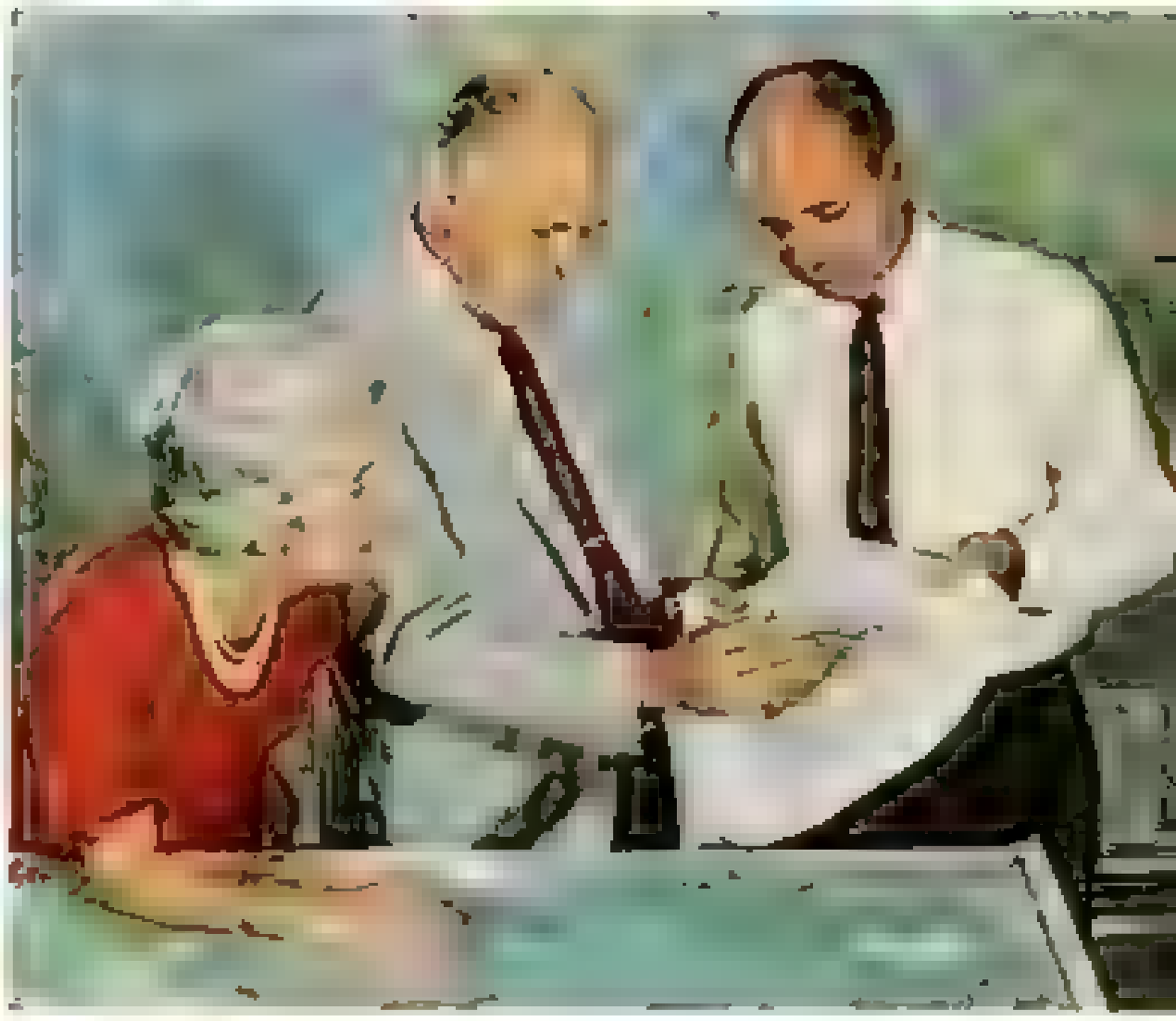

February supplement: new wall map of the world

NEXT MONTH'S NATIONAL GEOGRAPHIC [illegible] full portrait of our restless world. The new wall map, a special addition to the magazine's regular schedule of United States and World Atlas [illegible] features [illegible] features never shown on a map before [illegible] the Netherlands New Guinea, now part of Indonesia, becomes Sukarnapura in Africa, [illegible] Nyasaland gives way to Malawi, [illegible] only a bargain exchange [illegible] and other map supplements [illegible] share these rich benefits by [illegible] membership from the form [illegible]

[illegible] missile world map and such features [illegible] Ocean Now in the Nuclear Age [illegible] Bank Formation [illegible] The Lakes of Africa [illegible] North Toward the Pole [illegible] Birds That "See" in the Dark World [illegible] Far [illegible] next month.

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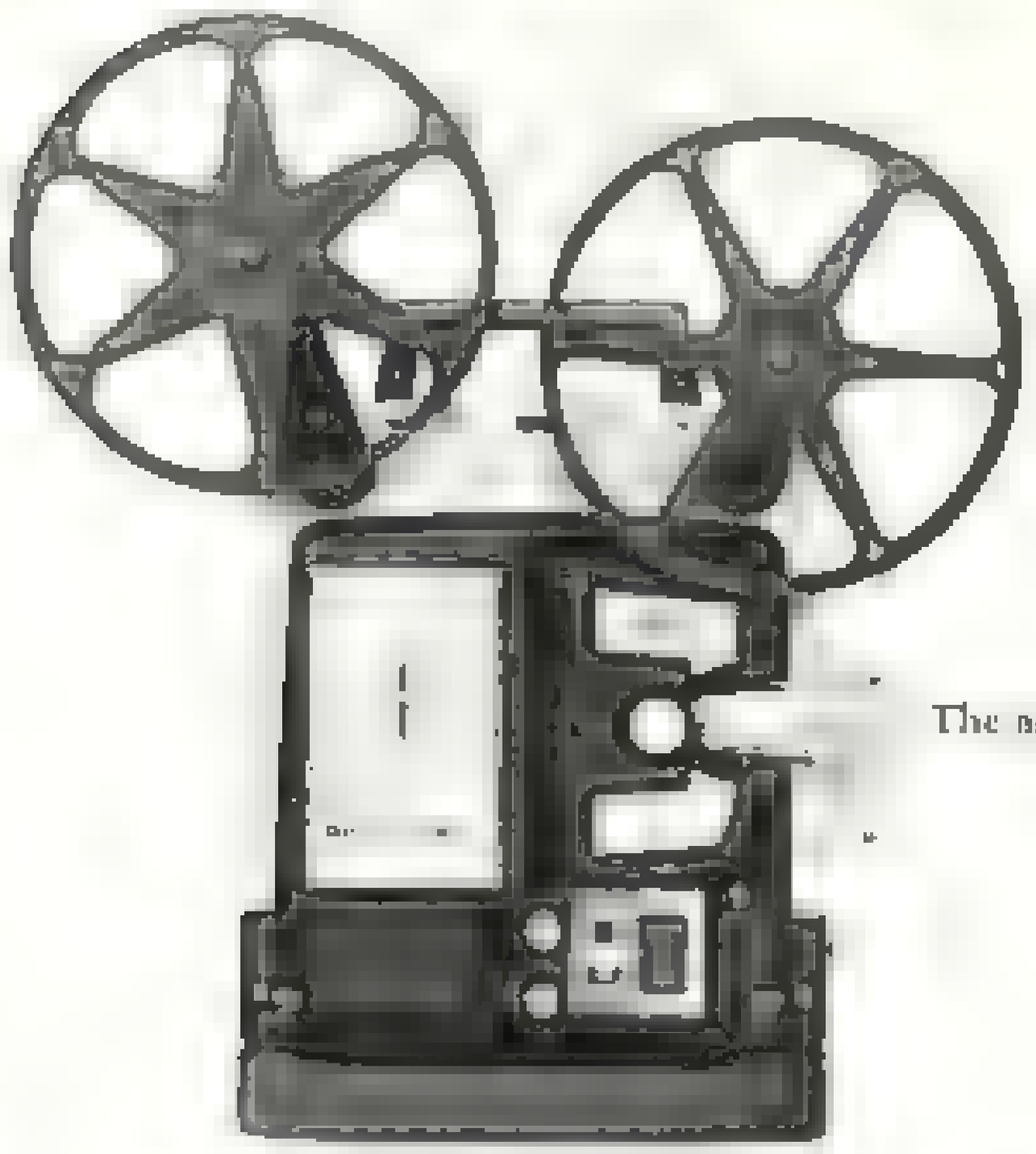
Someday, you'll want a photographic instrument that's built a little better than it really has to be.



The best home movie you get back is not of film, you

[illegible]

[illegible]

Bell & Howell builds photographic instruments a little better than they really have to be

SMALL WORLD?

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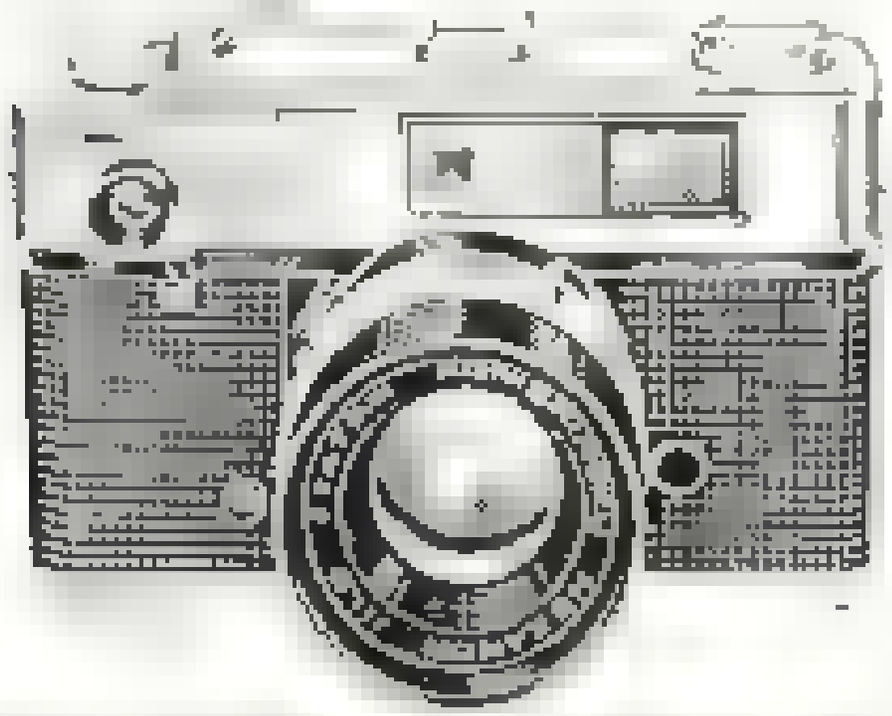

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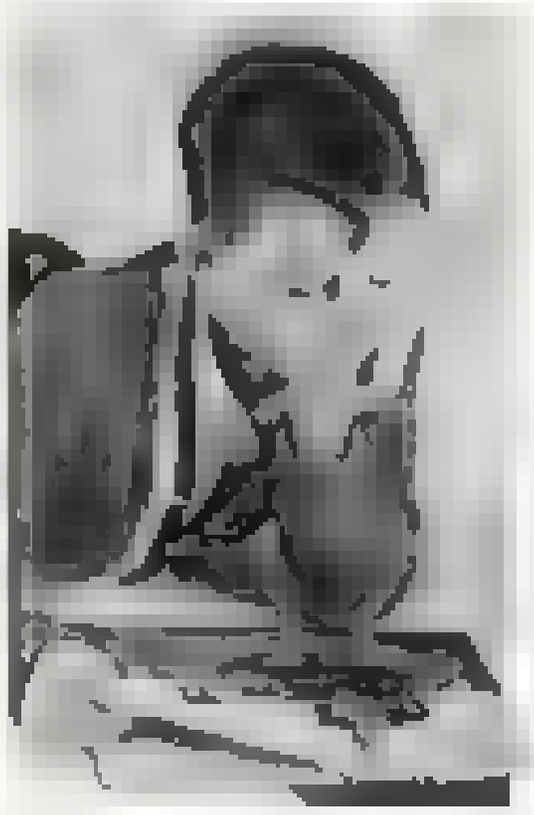

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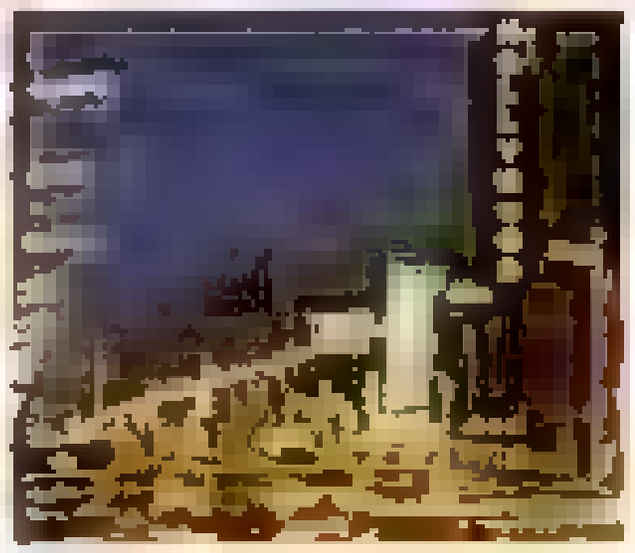

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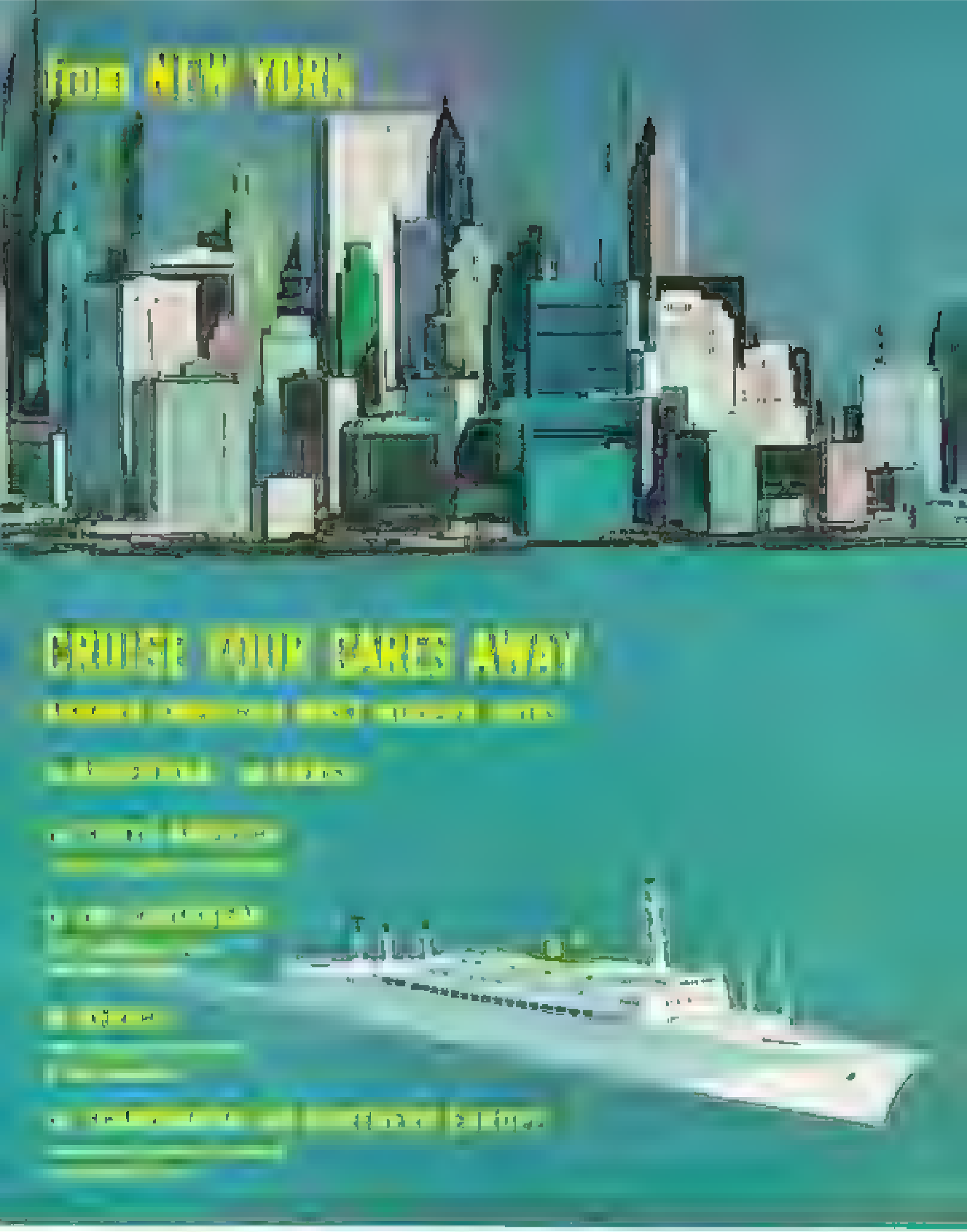
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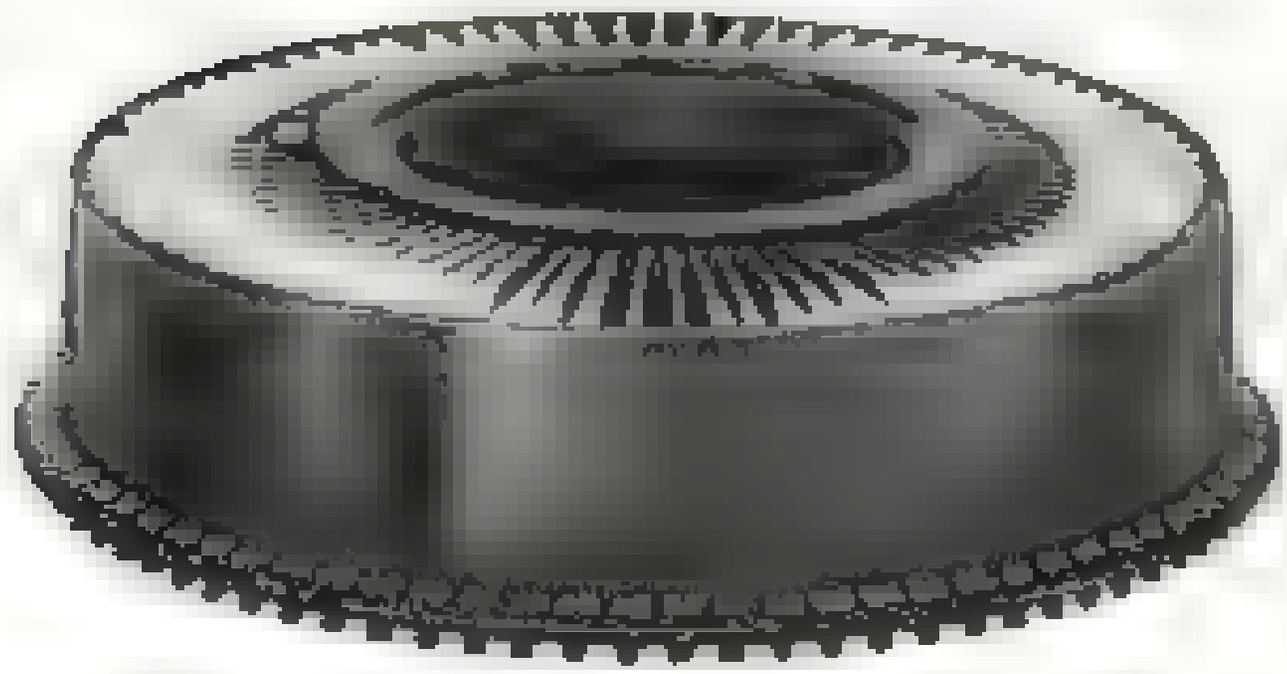

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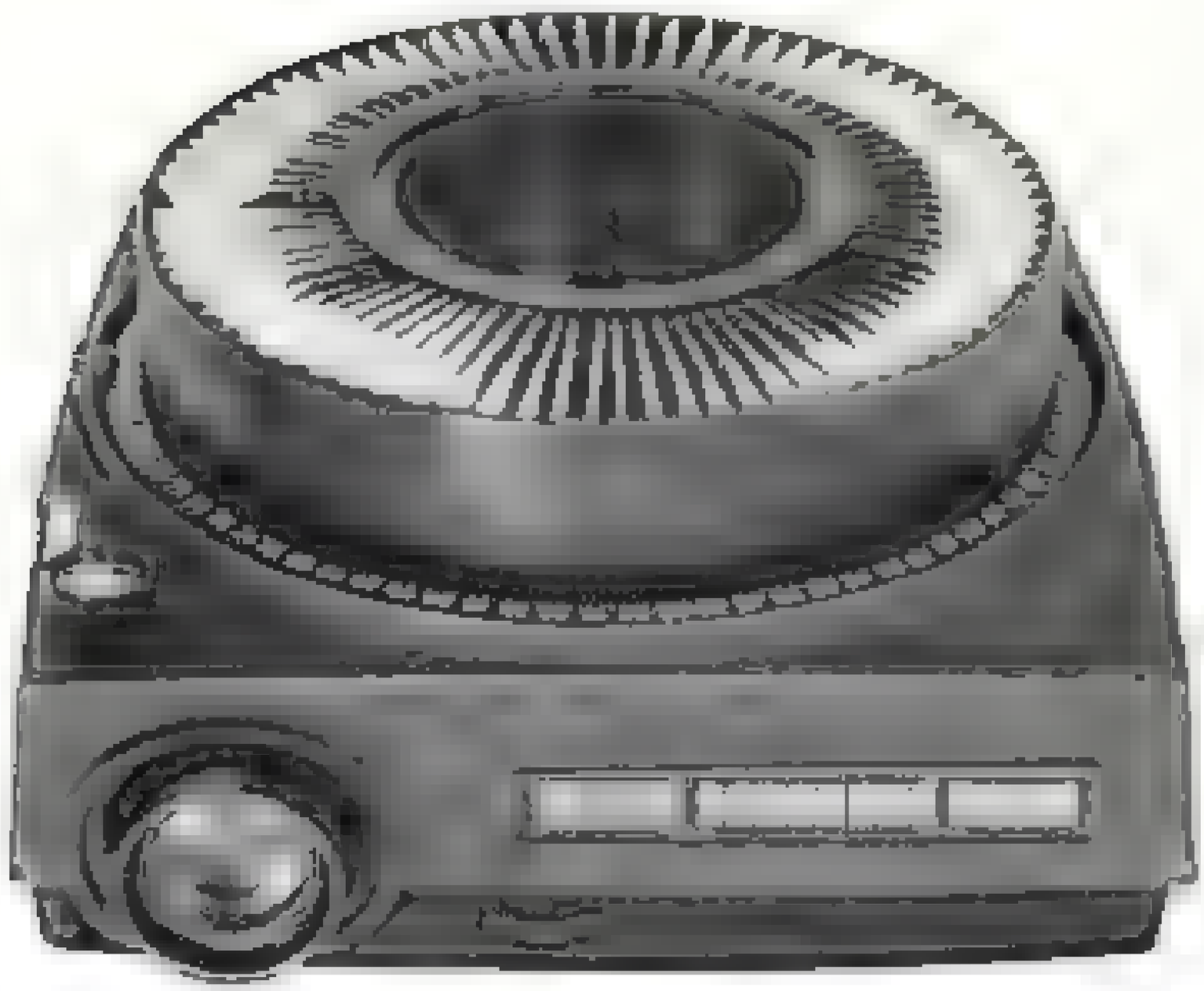

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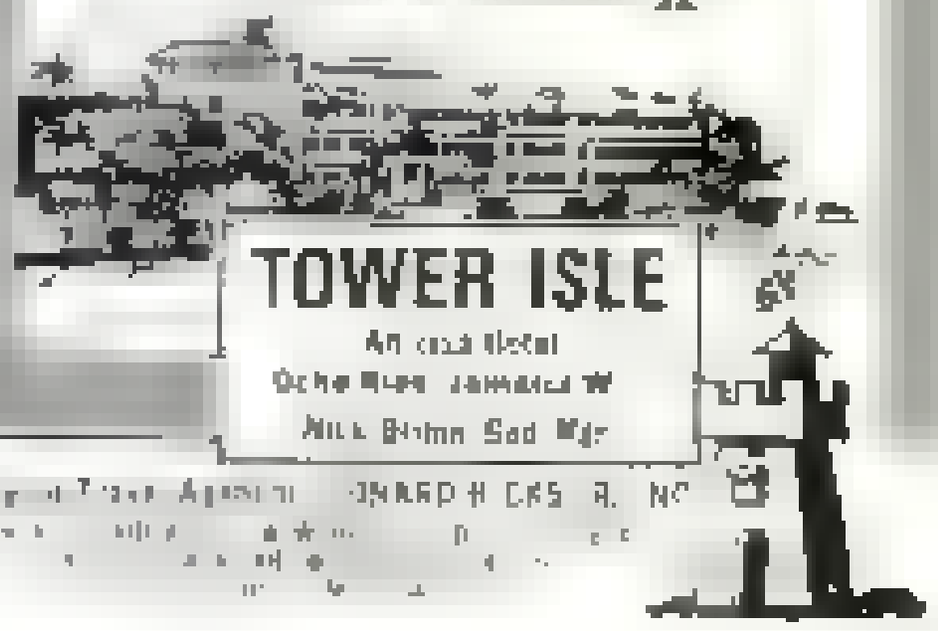

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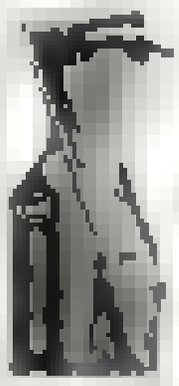

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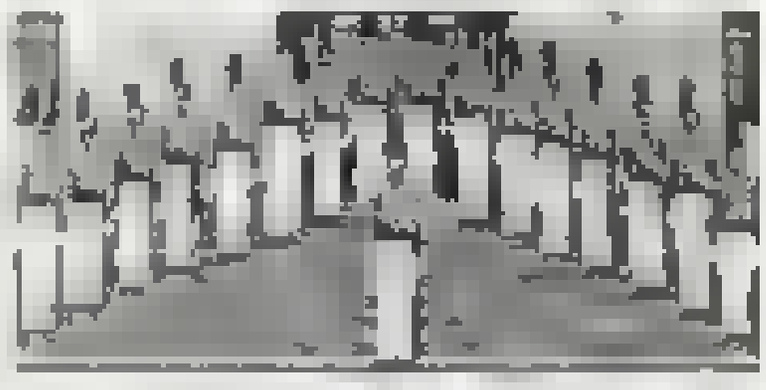

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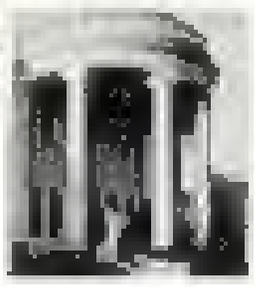

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